

06/11/99

JCS04 U.S. PTO

Please type a plus sign (+) inside this box → ☐Approved for use through 09/30/00. OMB 0651-0032
Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

UTILITY
PATENT APPLICATION
TRANSMITTAL

Attorney Docket No. 31812

Total Pages 76

First Named Inventor or Application Identifier

Abe Yasushi

(Only for new nonprovisional applications under 37 CFR 1.53(b))

Express Mail Label No. EL106191249US

APPLICATION ELEMENTS

See MPEP chapter 600 concerning utility patent application contents.

ADDRESS TO:

Assistant Commissioner for Patents
Box Patent Application
Washington, DC 20231

1. ☒ Fee Transmittal Form
(Submit an original, and a duplicate for fee processing)
2. ☒ Specification [Total Pages 57]
(preferred arrangement set forth below)
- Descriptive title of the invention
 - Cross References to Related Applications
 - Statement Regarding Fed sponsored R & D
 - Reference to Microfiche Appendix
 - Background of the invention
 - Brief Summary of the invention
 - Brief Description of the Drawings (if filed)
 - Detailed Description
 - Claim(s)
 - Abstract of the Disclosure
3. ☒ Drawing(s) (35 USC 113) [Total Sheets 17]
4. Oath or Declaration [Total Pages 2]
- a. ☒ Newly executed (original or copy)
 - b. ☐ Copy from a prior application (37 CFR 1.63(d))
(for continuation/divisional with Box 17 completed)
[Note Box 5 below]
 - i. ☐ DELETION OF INVENTOR(S)
Signed statement attached deleting
inventor(s) named in the prior application,
see 37 CFR 1.63(d)(2) and 1.33(b).
5. ☐ Incorporation By Reference (useable if Box 4b is checked)
The entire disclosure of the prior application, from which a
copy of the oath or declaration is supplied under Box 4b,
is considered as being part of the disclosure of the
accompanying application and is hereby incorporated by
reference therein.

6. ☐ Microfiche Computer Program (Appendix)
7. Nucleotide and/or Amino Acid Sequence Submission
(if applicable, all necessary)
- a. ☐ Computer Readable Copy
 - b. ☐ Paper Copy (Identical to computer copy)
 - c. ☐ Statement verifying identity of above copies

ACCOMPANYING APPLICATION PARTS

8. ☒ Assignment Papers (cover sheet & document(s))
9. ☐ 37 CFR 3.73(b) Statement ☒ Power of Attorney
(when there is an assignee)
10. ☐ English Translation Document (if applicable)
11. ☐ Information Disclosure Statement (IDS)/PTO-1449 ☐ Copies of IDS Citations
12. ☐ Preliminary Amendment
13. ☒ Return Receipt Postcard (MPEP 503)
(Should be specifically itemized)
14. ☐ Small Entity ☐ Statement filed in prior application,
Statement(s) Status still proper and desired
15. ☐ Certified Copy of Priority Document(s)
(if foreign priority is claimed)
16. ☒ Other: Check for \$1,780.00

17. If a CONTINUING APPLICATION, check appropriate box and supply the requisite information:

☐ Continuation ☐ Divisional ☐ Continuation-in-part (CIP) of prior application No: _____

18. CORRESPONDENCE ADDRESS

☒ Customer Number or Bar Code Label

000,116

or ☐ Correspondence address below

(Insert Customer No. or Attach bar code label here)

NAME

Jeffrey J. Sopko, Esq.

Pearne, Gordon, McCoy & Granger

ADDRESS

1200 Leader Building

CITY

Cleveland

STATE

Ohio

ZIP CODE

44114

COUNTRY

US

TELEPHONE

(216) 579-1700

FAX

(216) 579-6073

Burden Hour Statement: This form is estimated to take 0.2 hours to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, Patent and Trademark Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Box Patent Application, Washington, DC 20231.

PATENT

PEARNE, GORDON, McCOY & GRANGER
526 Superior Avenue, East
Suite 1200
Cleveland Ohio 44114-1484
(216) 579-1700

Attorney Docket No. 31812

Assistant Commissioner for Patents
Box PATENT APPLICATION
Washington, D.C. 20231

Sir:

Transmitted herewith for filing by other than a small entity is the patent application of:

Inventor: Abe Yasushi

For: RADIO PAGING RECEIVER AND MESSAGE ERASING
METHOD

17 sheets of formal drawings are included.

An assignment of the invention to Matsushita Electric Industrial Co., Ltd. is included along with a Recordation Form Cover Sheet. Please record and return the assignment to the undersigned.

Priority is claimed under 35 U.S.C. §119 on the basis of the following foreign applications:

Japanese Patent Application No. Hei. 10-192338 Filed June 24, 1998

A certified copy of this application will be forwarded.

"Express Mail" mailing label number EL106191249US

Date of Deposit 6/11/99

I hereby certify that this paper or fee is being deposited with the United States Postal Service "Express Mail Post Office to Addressee" service under 37 C.F.R. § 1.10 on the date indicated above and is addressed to the Assistant Commissioner for Patents, Washington, D.C. 20231.

Paula Almasy

Printed Name of Person Mailing Paper or Fee

Paula Almasy
Signature of Person Mailing Paper or Fee

CLAIMS AS FILED

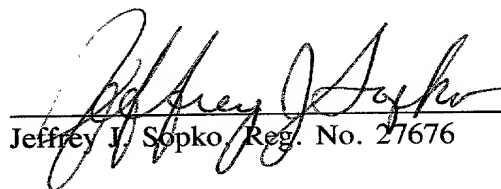
<u>For</u>	<u>Number</u>	<u>Rate</u>	<u>Fees</u>
Total claims in excess of 20:	27	× \$18.00	\$486.00
Independent claims in excess of 3:	3	× \$78.00	\$234.00
Multiple dependent claims, if any, add surcharge of \$270.00:			\$260.00
Non English Specification, add surcharge of \$130.00:			\$.00
		Basic Fee	\$760.00
		TOTAL FILING FEE	\$1,740.00
Assignment Recordal Fee of \$40.00			\$40.00
		<u>TOTAL FEE</u>	<u>\$1,780.00</u>

A check in the amount of the Total Fee calculated above is enclosed.

The Commissioner is hereby authorized to charge any fees under 37 C.F.R. §§1.16 and 1.17 which may be required during the entire pendency of this application, or to credit any overpayment, to Deposit Account No. 16-0820, Order No. 31812.

Respectfully,

PEARNE, GORDON, McCOY & GRANGER



Jeffrey J. Sopko, Reg. No. 27676

Date: 6/11/99

RADIO PAGING RECEIVER AND MESSAGE ERASING METHOD

BACKGROUND OF THE INVENTION

1. Field of the Invention

5 The present invention relates to a radio paging receiver and, more particularly, a radio paging receiver for displaying/calling a message corresponding to message data in a radio signal which is transmitted from a base station of a radio paging system.

10 2. Description of the Prior Art

FIG.17 is a block diagram showing a circuit configuration of a radio paging receiver in the prior art. In FIG.17, a receiver portion 21 is a circuit which receives a radio signal transmitted from a base station of a radio paging system via an antenna 21a, and then demodulates the radio signal into a digital signal. A decoder 22 is a circuit which applies a bit synchronization process and an error correction process to the received signal being converted into the digital signal, and then collates an address in the received signal with own address loaded in a memory portion 23. The memory portion 23 is a memory unit which has a memory element for erasing and writing data electrically, e.g., EEPROM (Electrically Erasable Programmable Read Only Memory), etc., and stores own address of the radio paging receiver, etc. A CPU 24 is a CPU (Central Processing Unit) which controls peripheral circuits based on the received signal sent out from the decoder 22.

15
20
25

A display driver 25 is a circuit which drives a display

portion 26 based on a display signal issued from the CPU 24. The display portion 26 is a unit which is driven by the display driver 25, and then displays data, etc. by liquid crystal elements, etc. in response to the display signal. A switch portion 27 is a unit which generates instructions according to the user's operation and various data. A signal issued from the switch portion 27 is input into the CPU 24 via the decoder 22. An informing driver 28 is a circuit which controls an informing portion 29 consisting of a speaker, a vibrator, etc.

Next, an operation of the above radio paging receiver will be explained hereunder. In the radio paging receiver, the receiver portion 21 receives the radio signal being transmitted from the base station (referred simply to as a "base station" hereinafter) of the radio paging system via the antenna 21a at a predetermined timing controlled by the CPU, then converts the radio signal into the digital signal by amplifying, frequency-converting, detecting and demodulating the received radio signal, and then sends out the digital signal to the decoder 22. The decoder 22 applies the bit synchronization process and the error correction process to the digital signal supplied from the receiver portion 21, and then collates an address contained in the received signal with own address read from the memory portion 23 via the CPU 24 to confirm whether or not the received signal is directed to own radio paging receiver.

If the received signal is directed to own radio paging receiver and message data is contained in the received signal, the decoder 22 picks up the message data, and then sends out the

message data to the CPU 24 and also outputs a driving signal to the informing driver 28. In parallel with this calling operation, the CPU 24 converts the message data into the display signal which consists of a combination of bit codes each having the

5 predetermined bit number, and then sends out the display signal to the display driver 25. The display driver 25 drives the display portion 26 based on the display signal sent out from the CPU 24 to display the message corresponding to the message data on the display portion 26. After the calling operation has been
10 completed, the CPU 24 stores the message data in a RAM 24a.

In this manner, in the prior art, the radio paging receiver receives the radio signal sent out from the base station, then executes the calling operation by a ringer tone, etc. and displays the message contained in the radio signal, and then stores the
15 message data in a RAM.

However, according to the above radio paging receiver, when the message data cannot be stored in a storage area, they are erased automatically in the order of older receiving time or they are erased from the storage area separately or collectively
20 according to the user's operation. In addition, in case an information broadcasting service is carried out by using the radio paging receiver, various information such as daily divination, sports prompt report, weather forecast, etc., which are available only on a certain day, are stored in the message storage area.

25 Accordingly, according to the radio paging receiver in the prior art, the user must erase the stale information from the storage area each time. As a result, the radio paging receiver

has such a problem that its utilization has become troublesome because of the frequent user's operation of erasing the message data, and thus the storage area has not been able to be utilized effectively.

5

SUMMARY OF THE INVENTION

The present invention has been made to overcome the above problem, and it is an object of the present invention to provide a radio paging receiver which is capable of releasing the user from the complicatedness to erase message and also utilizing effectively a message storage area by not storing the message therein or by erasing the message therefrom automatically.

In order to overcome the above problems, according to the present invention, there is provided a radio paging receiver including a receiving means for receiving a radio signal from a base station of a radio paging system, a first decoding means for picking up one calling address or a plurality of calling addresses assigned to own receiver from the radio signal received by the receiving means and picking up message data corresponding to the calling address or the calling addresses from the radio signal, and a data storing means for storing the message data, the radio paging receiver comprising a character sequence designating means for designating character sequences in stored messages; a character sequence retrieving means for detecting whether or not designated character sequences are contained in stored messages; a time counting means for monitoring whether or not a predetermined time has lapsed after the messages are stored; and an erasing means for erasing the stored messages from a storage area. According

to such configuration, concerned messages can be erased when it is detected by the character sequence retrieving means that the designated character sequences are contained in the stored messages and it is detected by the time counting means that the
5 predetermined time has lapsed after the messages are stored.

Also, according to the present invention, the radio paging receiver comprises a character sequence inputting means, the character sequence retrieving means, the time counting means, and the erasing means. According to such configuration,
10 character sequences which are retrieved to erase messages can be input by the character sequence inputting means.

Also, according to the present invention, the[^] radio paging receiver comprises the first decoding means for picking up a plurality of calling addresses assigned to own receiver and
15 picking up message data corresponding to the calling addresses, an address associated storing means for storing the message data picked up by the first decoding means every calling address; an address setting means for designating the calling addresses as objects of erasure by time counting; the time counting means, and
20 the erasing means. According to such configuration, erasure of the messages can be effected by the address setting means and the time counting means.

Also, according to the present invention, the radio paging receiver comprises a second decoding means for picking up
25 message data which are classified into a hierarchical structure and transmitted to own address; a hierarchy associated storing means for storing the message data which are picked up by the second

decoding means every hierarchy; a hierarchy setting means for designating hierarchies as objects of erasure by time counting; the time counting means, and the erasing means. According to such configuration, erasure of the messages can be effected by the hierarchy setting means and the time counting means.

Also, according to the present invention, the radio paging receiver comprises a time setting means for inputting times as timings for erasure of the messages by a user; a time monitoring means for monitoring whether or not a time coincides with an input time; and the erasing means. According to such configuration, the erasure of the messages which contain predetermined character sequences or belong to predetermined addresses or predetermined hierarchies can be effected periodically and automatically at respective times which are input by the user.

Also, according to the present invention, the radio paging receiver comprises a day-of-the-week setting means for inputting a day of the week as timings for erasure of the messages by a user; a day-of-the-week monitoring means for monitoring whether or not a day of the week coincides with an input day of the week; and the erasing means. According to such configuration, the erasure of the messages which contain predetermined character sequences or belong to predetermined addresses or predetermined hierarchies can be effected periodically and automatically at respective days of the week which are input by the user.

According to the present invention, there is provided a radio paging receiver including a receiving means, a first decoding means, a data storing means for storing the message data

picked up by the first decoding means, and one address or a plurality of addresses, the radio paging receiver comprising a character sequence designating means for designating character sequences in stored messages; a received character sequence
5 retrieving means for detecting whether or not designated character sequences are contained in received messages; and an erasing means for erasing the messages. According to such configuration, when designated character sequences are contained in the received messages, the messages cannot be stored in a
10 storage area but can be erased after the messages have been checked.

Also, according to the present invention, the radio paging receiver comprises a character sequence inputting means, the character sequence retrieving means, and the erasing means.

15 According to such configuration, character sequences which are retrieved to erase messages can be input by the character sequence inputting means after the messages have been checked at the time of reception.

Also, according to the present invention, the radio
20 paging receiver comprises a second decoding means for picking up a plurality of calling addresses assigned to own receiver and picking up message data which are transmitted to own address; a storing means for storing the message data which are picked up by the second decoding means every address; an address setting
25 means for designating addresses as objects of erasure at a time of reception; and the erasing means. According to such configuration, the messages related to particular addresses

cannot be stored in the storage area but can be erased after the messages have been checked.

Also, according to the present invention, the radio paging receiver comprises a third decoding means for picking up
5 message data which are classified into a hierarchical structure and transmitted to own address; a second storing means for storing the message data which are picked up by the third decoding means every hierarchy; a hierarchy setting means for designating hierarchies as objects of erasure at a time of reception; and the
10 erasing means. According to such configuration, the messages belonging to particular hierarchies cannot be stored in the storage area but can be erased after the messages have been checked.

According to the present invention, there is provided a
15 radio paging receiver including the receiving means, the first decoding means, the data storing means, and one address or a plurality of addresses, the radio paging receiver comprising a character sequence designating means for designating character sequences in stored messages; a stored character sequence
20 retrieving means for detecting whether or not designated character sequences are contained in stored messages; and an erasing means for erasing the messages. According to such configuration, when designated character sequences are contained in the stored messages, the messages can be erased collectively
25 concerned messages.

Also, according to the present invention, the radio paging receiver comprises a character sequence inputting means,

the character sequence retrieving means, and the erasing means.

According to such configuration, character sequences which are retrieved to erase collectively messages can be input by the character sequence inputting means.

5 Also, according to the present invention, the radio paging receiver comprises a second decoding means for picking up a plurality of calling addresses assigned to own receiver and picking up message data which are transmitted to own address; a first storing means for storing the message data which are picked
10 up by the second decoding means every address; an address setting means for designating addresses as objects of erasure according to character sequence conditions; and the erasing means.

According to such configuration, the messages related to particular addresses can be erased collectively when the messages
15 contain designated character sequences.

Also, according to the present invention, the radio paging receiver comprises a third decoding means for picking up message data which are classified into a hierarchical structure and transmitted to own address; a second storing means for storing
20 the message data which are picked up by the third decoding means every hierarchy; a hierarchy setting means for designating hierarchies as objects of erasure according to character sequence conditions; and the erasing means. According to such configuration, the messages belonging to particular hierarchies
25 can be erased collectively when the messages contain designated character sequences.

Furthermore, according to the present invention, there

is provided a message erasing method for the above-mentioned radio paging receiver.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG.1 is a block diagram showing a circuit configuration
5 of a radio paging receiver according to a first embodiment of the present invention;

FIG.2 is a flowchart showing a message erasing method for the radio paging receiver according to the first embodiment of the present invention;

10 FIG.3 is a block diagram showing a circuit configuration of a radio paging receiver according to a second embodiment of the present invention;

FIG.4 is a flowchart showing a message erasing method for the radio paging receiver according to the second embodiment of
15 the present invention;

FIG.5 is a block diagram showing a circuit configuration of a radio paging receiver according to a third embodiment of the present invention;

FIG.6 is a flowchart showing a message erasing method for
20 the radio paging receiver according to the third embodiment of the present invention;

FIG.7 is a block diagram showing a circuit configuration of a radio paging receiver according to a fourth embodiment of the present invention;

25 FIG.8 is a flowchart showing a message erasing method for the radio paging receiver according to the fourth embodiment of the present invention;

FIG.9 is a block diagram showing a circuit configuration of a radio paging receiver according to a fifth embodiment of the present invention;

5 FIG.10 is a flowchart showing a message erasing method for the radio paging receiver according to the fifth embodiment of the present invention;

FIG.11 is a block diagram showing a circuit configuration of a radio paging receiver according to a sixth embodiment of the present invention;

10 FIG.12 is a flowchart showing a message erasing method for the radio paging receiver according to the sixth embodiment of the present invention;

FIG.13 is a block diagram showing a circuit configuration of a radio paging receiver according to a seventh embodiment of the present invention;

FIG.14 is a flowchart showing a message erasing method for the radio paging receiver according to the seventh embodiment of the present invention;

15 FIG.15 is a block diagram showing a circuit configuration of a radio paging receiver according to an eighth embodiment of the present invention;

FIG.16 is a flowchart showing a message erasing method for the radio paging receiver according to the eighth embodiment of the present invention; and

25 FIG.17 is a block diagram showing a circuit configuration of a radio paging receiver in the prior art.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Subsequently, embodiments of the present invention will be explained in detail with reference to FIGS.1 to 16 hereinafter.

5

First Embodiment

A first embodiment of the present invention corresponds to a radio paging receiver which can designate any character sequences in stored messages, and then erase the concerned messages automatically after a predetermined time has been lapsed from the time when the messages containing the character sequences are stored.

10

15

20

25

FIG.1 is a block diagram showing a circuit configuration of the radio paging receiver according to the first embodiment of the present invention. In FIG.1, a receiver portion 1 is a circuit which receives a radio signal transmitted from a base station (not shown) of a radio paging system, and then demodulates the radio signal into a digital signal. A decoder 2 is a circuit which applies a bit synchronization process and an error correction process to the received signal which has been converted into the digital signal, and then collates an address in the received signal with own address loaded in a memory portion 3.

The memory portion 3 is a memory unit which has a memory element for erasing and writing data electrically, e.g., the EEPROM, etc., and stores own address of the radio paging receiver, etc. A CPU 4 is a CPU which controls various peripheral circuits. A display driver 5 is a circuit which drives a display portion 6 based on a display signal issued from the CPU 4. The display portion 6

is a unit which is driven by the display driver 5, and then displays data, etc. by liquid crystal elements, etc. in response to the display signal. A switch portion 7 is a unit which generates instructions according to the user's operation and various data.

5 A signal issued from the switch portion 7 is input into the CPU 4 via the decoder 2. An informing driver 8 is a circuit which drives an informing portion 9 consisting of a speaker, a vibrator, etc.

Next, an operation of the radio paging receiver according to the first embodiment of the present invention will be explained hereunder. In the radio paging receiver, the receiver portion 1 receives the radio signal being transmitted from the base station of the radio paging system via the antenna 1a. The receiver portion 1 then converts the radio signal into the digital signal by amplifying, frequency-converting, detecting and demodulating the received radio signal. The receiver portion 1 then sends out the digital signal to the decoder 2. The decoder 2 applies the bit synchronization process and the error correction process to the digital signal supplied from the receiver portion 1. The decoder 2 then collates an address contained in the received signal with own address being read from the memory portion 3 via the CPU 4 to detect whether or not the received signal is directed to own radio paging receiver.

If the received signal is directed to own radio paging receiver and the message data is contained in the received signal, the decoder 2 takes out the message data. The decoder 2 then sends out the message data to the CPU 4 and also outputs a driving signal

to the informing driver 8.

The CPU 4 has a character sequence designating means 4b which can designate any character sequences by the user from the messages stored in a RAM 4a. The CPU 4 also has a character
5 sequence retrieving means 4c which can retrieve whether or not the character sequences being designated by the character sequence designating means 4b are contained in the received messages. The CPU 4 also has a time counting means 4d which counts a predetermined lapsed time from the storing operation if the
10 messages in which the designated character sequences are contained are detected. The CPU 4 also has an erasing means 4e which erases the messages stored in the RAM 4a from the RAM 4a.

In the first embodiment of the present invention, the RAM 4a for storing the message is built in the CPU 4. However, the
15 RAM may be provided on the outside of the CPU in place of the built-in type RAM.

FIG.2 is a flowchart showing an automatic message erasing process in the radio paging receiver according to the first embodiment of the present invention. The automatic message
20 erasing process will be explained with reference to FIG.2 hereunder.

Under the condition of the radio paging receiver which is synchronized with the base station by turning on the power supply, the radio paging receiver decides whether or not it is
25 at a receiving timing assigned to own radio paging receiver (step S21). Unless the radio paging receiver has been at the receiving timing in step S21, it keeps a stand-by state according to a

stand-by process (step S29). If the radio paging receiver has been at the receiving timing in step S21, it decides whether or not the message (information) directed to own radio paging receiver is contained in the data being received from the base station (step S22). Unless the message directed to own radio paging receiver has been contained in step S22, the radio paging receiver is shifted into the stand-by state according to the stand-by process in step S29. If the received message has been contained in step S22, a calling operation is started (step S23) and then the radio paging receiver waits whether or not the call-stopping operation is input by the user (step S24). Unless the call-stopping operation has been input by the user in step S24, the radio paging receiver performs a calling time-out process after a predetermined time (step S2d) and then it is shifted into the stand-by state in step S29. In contrast, if the user performs the call-stopping operation by the switch portion 7 (FIG.1) during the calling operation in step S24, the radio paging receiver shifts to step S25 to retrieve whether or not the designated character sequences are contained in the received message. Unless no designated character sequence has been contained in step S25, the message is stored in the RAM 4a (FIG.1) according to a message storing process (step S28). If the designated character sequences have been contained in the received message in step S25, a flag indicating that the designated character sequences are present is set (step S26), then a time counting means 4d (FIG.1) for counting a predetermined time required until erase of the message is started (step S27) prior to the message storing process

(step S28). In this case, any character sequences can be designated as the designated character sequences among stored messages by the user previously by using the character sequence designating means 4b (FIG.1). The predetermined time required until erase of the message can be held fixedly previously by using the time counting means 4d (FIG.1). After the message has been stored (step 28), the process is shifted into the stand-by state according to the stand-by process (step S29). At that time, it is decided whether or not the flag indicating that the designated character sequences are present has been set (step S2a). If the flag has been set in step S2a, a decision process is effected to decide whether or not a predetermined time required for the erasing operation has been lapsed (step S2b) after the message has been stored. If the predetermined time has been lapsed in step S2b, the concerned message erasing process is carried out to erase the messages which contain the designated character sequences (step S2c). If both conditions in step S2a and step S2b are not satisfied, the processes from step S21 to step S29 are executed repeatedly to execute the operation to wait for the receiving timing which is assigned to own radio paging receiver.

As described above, according to the radio paging receiver of the first embodiment of the present invention, complicatedness in erasing the messages unnecessary for the user can be reduced by designating any character sequences from the stored messages to set any character sequences and then erasing automatically the messages containing the designated character sequences after a predetermined time has been lapsed from the time

when the messages containing the character sequences are stored,
for example, by erasing automatically the messages (information)
such as weather forecast, etc. which are available limitatively
on a certain day after a predetermined time has been lapsed from
5 their storage.

The character sequences may be set by inputting the
characters by the switch portion 7. In this case, the similar
advantage can be achieved.

Second Embodiment

10 A second embodiment of the present invention corresponds
to a radio paging receiver which can erase automatically the
message with designated addresses after a predetermined time has
been lapsed from the storing operation of the message.

FIG.3 is a block diagram showing a circuit configuration
15 of the radio paging receiver according to the second embodiment
of the present invention. In FIG.3, the same symbols as those
in FIG.1 are affixed to constituent elements corresponding to the
constituent elements which have been explained with reference to
FIG.1, and their explanation will be omitted. A difference
20 between the radio paging receiver according to the second
embodiment and radio paging receiver according to the first
embodiment resides in that an address associated storing means
4f and an address setting means 4g are provided to the CPU 4.

In FIG.3, the address associated storing means 4f is a
25 means which enables to store the messages while discriminating
each address employed in the receiving operation among a plurality
of addresses when the messages are to be stored in the RAM 4a.

The address setting means 4g is a means which sets the addresses selected as objects when the messages are erased automatically after a predetermined time has been lapsed after the storing operation. This setting is executed according to an instruction
5 signal issued by the user's operation of the switch portion 7.

FIG.4 is a flowchart showing an automatic message erasing process in the radio paging receiver according to the second embodiment of the present invention. The automatic message erasing process will be explained with reference to FIG.4
10 hereunder.

Under the condition of the radio paging receiver which is synchronized with the base station by turning on the power supply, the radio paging receiver decides whether or not it is at a receiving timing assigned to own radio paging receiver (step
15 S41). Unless the radio paging receiver has been at the receiving timing in step S41, it keeps a stand-by state according to a stand-by process (step S48). In contrast, if the radio paging receiver has been at the receiving timing in step S41, it decides whether or not the messages (information) directed to own radio
20 paging receiver are contained in the data being received from the base station (step S42). Unless the message directed to own radio paging receiver has been contained in step S42, the radio paging receiver is shifted into the stand-by state according to the stand-by process in step S48. If the message directed to own radio
25 paging receiver has been contained in step S42, a calling operation is started (step S43) and then the radio paging receiver waits whether or not the call-stopping operation is input by the user

(step S44). Unless the call-stopping operation has been input by the user in step S44, the radio paging receiver performs a calling time-out process after a predetermined time (step S4b) and then it is shifted into the stand-by state in step S48. In contrast, if the user performs the call-stopping operation by the

switch portion 7 (FIG.3) during the calling operation in step S44, the message is stored in the RAM 4a (FIG.3) by the message storing process (step S45). If the received message has had the designated address in step S46, a time counting means 4d (FIG.3) for counting a predetermined time required until erase of the message is started (step S47). Unless the received message has had the designated address in step S46, the time counting means 4d (FIG.3) is not started and then the process goes to step S48.

In this case, the designated address can be designated previously by the user by using the address setting means 4g (FIG.3). The messages are stored in the RAM 4a (FIG.3) by using the address associated storing means 4f (FIG.3) such that the addresses can be identified from each other. Also, the predetermined time required until erase of the message can be fixedly held previously by using the time counting means 4d (FIG.3).

Then, the radio paging receiver is shifted into the stand-by state according to the stand-by process (step S48), and then a decision process is carried out to decide whether or not the predetermined time has been lapsed after the message has been stored (step S49). If the predetermined time has been lapsed in step S49, the messages which have the designated addresses are erased (step S4a). Unless the predetermined time has been lapsed

in step S49, the processes from step S41 to step S49 are repeated to execute the operation to wait for the receiving timing which is assigned to own radio paging receiver.

As described above, according to the radio paging receiver of the second embodiment of the present invention, since the radio paging receiver is constructed to erase the concerned messages automatically after a predetermined time has been lapsed from the time when such messages with the designated addresses are stored, complicatedness in erasing the messages unnecessary for the user can be reduced by erasing automatically the messages with the addresses, which have a relatively low degree of importance for the user, from all the stored messages after a predetermined time has been lapsed from the time when such messages are stored.

Third Embodiment

A third embodiment of the present invention corresponds to a radio paging receiver which can erase automatically the messages belonging to the designated hierarchy after a predetermined time has been lapsed from the storing operation.

FIG.5 is a block diagram showing a circuit configuration of the radio paging receiver according to the third embodiment of the present invention. In FIG.5, the same symbols as those in FIG.1 are affixed to constituent elements corresponding to the constituent elements which have been explained with reference to FIG.1, and their explanation will be omitted. A difference between the radio paging receiver according to the third embodiment and radio paging receiver according to the first

embodiment resides in that a hierarchy associated storing means 4h and a hierarchy setting means 4i are provided to the CPU 4.

In FIG.5, the hierarchy associated storing means 4h which enables to store the messages which are identified and transmitted as an hierarchical structure according to respective hierarchies (fields), while discriminating each hierarchy (field) employed in the receiving operation among a plurality of hierarchies (fields) at certain addresses when the messages are to be stored in the RAM 4a. The hierarchy setting means 4i is a means which sets the hierarchies selected as objects when the messages are erased automatically after a predetermined time has been lapsed after the storing operation. This setting is executed according to an instruction signal issued by the user's operation of the switch portion 7.

FIG.6 is a flowchart showing a message automatic erasing process in the radio paging receiver according to the third embodiment of the present invention. The automatic message erasing process will be explained with reference to FIG.6 hereunder.

Under the condition of the radio paging receiver which is synchronized with the base station by turning on the power supply, the radio paging receiver decides whether or not it is at a receiving timing assigned to own radio paging receiver (step S61). Unless the radio paging receiver has been at the receiving timing in step S61, it keeps a stand-by state according to a stand-by process (step S68). If the radio paging receiver has been at the receiving timing in step S61, it decides whether or

not the message (information) directed to own radio paging receiver is contained in the data being received from the base station (step S62). Unless the message directed to own radio paging receiver has been contained in step S62, the radio paging receiver is shifted into the stand-by state according to the stand-by process in step S68. If the message directed to own radio paging receiver has been contained in the received messages in step S62, a calling operation is started (step S63) and then the radio paging receiver waits whether or not the call-stopping operation is input by the user (step S64). Unless the call-stopping operation has been input by the user in step S64, the radio paging receiver performs a calling time-out process after a predetermined time (step S6b) and then it is shifted into the stand-by state in step S68. In contrast, if the user performs the call-stopping operation by the switch portion 7 (FIG.5) during the calling operation in step S64, the message is stored in the RAM 4a (FIG.5) by the message storing process (step S65). If the received message has belonged to the designated hierarchies in step S66, a time counting means 4d (FIG.5) for counting a predetermined time from storage to erase of the message is started (step S67). Unless the stored messages has belonged to the designated hierarchies in step S66, the time counting means 4d (FIG.5) is not started and then the process goes to step S68. In this case, the designated hierarchies can be designated previously by the user by using the hierarchy setting means 4i (FIG.5). The messages are stored in the RAM 4a (FIG.5) by using the hierarchy associated storing means 4h (FIG.5) such that the

hierarchies can be identified from each other. Also, the predetermined time required to erase the message can be fixedly held previously by using the time counting means 4d (FIG.5).

Then, the radio paging receiver is shifted into the stand-by state according to the stand-by process (step S68), and then a decision process is carried out to decide whether or not the predetermined time has been lapsed after the message has been stored (step S69). If the predetermined time has been lapsed in step S69, the messages which have belonged to the designated hierarchies are erased (step S6a). Unless the predetermined time has been lapsed in step S69, the processes from step S61 to step S69 are repeated to execute the operation to wait for the receiving timing which is assigned to own radio paging receiver.

As described above, according to the radio paging receiver of the third embodiment of the present invention, since the messages belonging to the designated hierarchies can be erased automatically from the stored messages after a predetermined time has been lapsed from the storing operation, complicatedness in erasing the messages unnecessary for the user can be reduced by erasing automatically the messages (information) belonging to the hierarchies (fields), which have a relatively low degree of importance for the user, from all the stored messages after a predetermined time has been lapsed from the time when such messages are stored.

Fourth Embodiment

A fourth embodiment of the present invention corresponds to a radio paging receiver which can designate any character

sequences in stored messages and then erase automatically the messages containing the designated character sequences at a predetermined time.

FIG.7 is a block diagram showing a circuit configuration of the radio paging receiver according to the fourth embodiment of the present invention. In FIG.7, the same symbols as those in FIG.1 are affixed to constituent elements corresponding to the constituent elements which have been explained with reference to FIG.1, and their explanation will be omitted. A difference between the radio paging receiver according to the fourth embodiment and radio paging receiver according to the first embodiment resides in that a time setting means 4j and a time monitoring means 4k are provided to the CPU 4.

In FIG.7, the time setting means 4j is a means which sets a time at which the messages containing the character sequences designated by the user are to be erased automatically. This setting is executed according to an instruction signal issued by the user's operation of the switch portion 7. The time monitoring means 4k is a means which monitors whether or not a time coincides with an erasing time which is set by the time setting means 4j.

FIG.8 is a flowchart showing an automatic message erasing process in the radio paging receiver according to the fourth embodiment of the present invention. The automatic message erasing process will be explained with reference to FIG.8 hereunder.

Under the condition of the radio paging receiver which is synchronized with the base station by turning on the power

supply, the radio paging receiver decides whether or not it is at a receiving timing assigned to own radio paging receiver (step S81). Unless the radio paging receiver has been at the receiving timing in step S81, it keeps a stand-by state according to a stand-by process (step S88). If the radio paging receiver has been at the receiving timing in step S81, it decides whether or not the message (information) directed to own radio paging receiver is contained in the data being received from the base station (step S82). Unless the message directed to own radio paging receiver has been contained in step S82, the radio paging receiver is shifted into the stand-by state according to the stand-by process in step S88. If the message directed to own radio paging receiver has been contained in step S82, a calling operation is started (step S83) and then the radio paging receiver waits whether or not the call-stopping operation is input by the user (step S84). Unless the call-stopping operation has been input by the user in step S84, the radio paging receiver performs a calling time-out process after a predetermined time (step S8d) and then it is shifted into the stand-by state in step S88. In contrast, if the user performs the call-stopping operation by the switch portion 7 (FIG.7) during the calling operation in step S84, the radio paging receiver retrieves whether or not the designated character sequences are contained in the received messages (step S85). Unless the designated character sequences have been contained in step S85, the messages are stored in the RAM 4a (FIG.7) by the message storing process (step S87). If the designated character sequences have been contained in the received messages

in step S85, a flag indicating that the designated character sequences are present is set (step S86). In this case, any character sequences can be selected previously from all the stored messages by the user as the designated character sequences by using the character sequence designating means 4b (FIG.7). After the messages are stored in the RAM 4a (FIG.7) according to a message storing process (step S87), the radio paging receiver is shifted into the stand-by state according to the stand-by process (step S88), and then it is decided whether or not the flag indicating that the designated character sequences are present has been set (step S89). Unless the flag has been set in step S89, the radio paging receiver keeps the stand-by state according to the stand-by process in step S88 until the receiving timing is satisfied in step S81. If the flag has been set in step S89, the time monitoring means 4k (FIG.7) checks whether or not a time and minute coincide with the time and minute at which the messages are to be erased respectively (step S8a and step S8b). Unless either of the time and the minute coincides with the erasing time and minute in step S8a and step S8b, the processes from step S81 to step S8b are repeatedly executed. If both the time and the minute coincide with the erasing time and minute in step S8a and step S8b, the concerned messages including the designated character sequences are erased (step S8c).

As described above, according to the radio paging receiver of the fourth embodiment of the present invention, since the radio paging receiver is constructed to designate any character sequences in the stored messages and then erase the

concerned messages including the character sequences automatically at the predetermined time and minute, complicatedness in erasing the messages unnecessary for the user can be reduced.

5 If the storage area in which a large quantity of received messages can be stored is provided the radio paging receiver, the similar advantage can be achieved by erasing automatically the messages at a predetermined day of the week employed in place of the above predetermined time.

10 Fifth Embodiment

65 790-66449
15 A fifth embodiment of the present invention corresponds to a radio paging receiver which can designate any character sequences in stored messages and then erase automatically the messages containing the designated character sequences when the concerned messages are received.

20 FIG.9 is a block diagram showing a circuit configuration of the radio paging receiver according to the fifth embodiment of the present invention. In FIG.9, the same symbols as those in FIG.1 are affixed to constituent elements corresponding to the constituent elements which have been explained with reference to FIG.1, and their explanation will be omitted. A difference between the radio paging receiver according to the fifth embodiment and radio paging receiver according to the first embodiment resides in that a received character sequence
25 retrieving means 40 which retrieves whether or not the designated character sequences are contained in the messages after the messages are received but before they are stored is provided to

the CPU 4.

In FIG.9, the received character sequence retrieving means 4o is a means which does not store the received messages in the RAM 4a (FIG.9) but erases automatically them if the character sequences designated by the user are contained in the received messages. Like the first embodiment, this setting of the designated character sequences is executed according to an instruction signal issued by the user's operation of the switch portion 7.

FIG.10 is a flowchart showing an automatic message erasing process in the radio paging receiver according to the fifth embodiment of the present invention. The automatic message erasing process will be explained with reference to FIG.10 hereunder.

Under the condition of the radio paging receiver which is synchronized with the base station by turning on the power supply, the radio paging receiver decides whether or not it is at a receiving timing assigned to own radio paging receiver (step S101). Unless the radio paging receiver has been at the receiving timing in step S101, it keeps a stand-by state according to a stand-by process (step S109). In contrast, if the radio paging receiver has been at the receiving timing in step S101, it decides whether or not the messages (information) directed to own radio paging receiver are contained in the data being received from the base station (step S102). Unless the messages directed to own radio paging receiver has been contained in step S102, the radio paging receiver is shifted into the stand-by state according to

the stand-by process in step S109. While, if the messages directed to own radio paging receiver has been contained in step S102, a calling operation is started (step S103) and then the radio paging receiver waits whether or not the call-stopping operation is input by the user (step S104). Unless the call-stopping operation has been input by the user in step S104, the radio paging receiver performs a calling time-out process after a predetermined time (step S10a) and then it is shifted into the stand-by state in step S109. On the contrary, if the user performs the call-stopping operation by the switch portion 7 (FIG.9) during the calling operation in step S104, the process advances to step S105 to retrieve the designated character sequences from the received messages, and then it is decided whether or not the designated character sequences have been contained in the received messages (step S106). Unless the designated character sequences have been contained in step S106, the messages are stored in the RAM 4a (FIG.9) by the message storing process (step S108) and then the process proceeds to the stand-by state in step S109.

In contrast, if it is decided in step S106 that the designated character sequences have been contained in the received messages, the messages are erased (step S107) and then the process also goes to the stand-by state in step S109. Subsequently, the similar processes are repeated.

As described above, according to the radio paging receiver of the fifth embodiment of the present invention, since the radio paging receiver is constructed to designate any character sequences in the stored messages and then erase the

messages including the character sequences automatically when the concerned messages are received thereafter. Therefore, the message storage area can be utilized effectively because there is no necessity to store the messages which need the check only once at the time of calling.

If the character sequences which are designated by inputting the characters by using the switch portion 7 are employed instead of the character sequences which are designated in the stored messages, the similar advantage can be achieved.

Sixth Embodiment

A sixth embodiment of the present invention corresponds to a radio paging receiver which can designate hierarchies and then erase automatically the messages belonging to the designated hierarchies not to store them when the concerned messages are received.

FIG.11 is a block diagram showing a circuit configuration of the radio paging receiver according to the sixth embodiment of the present invention. In FIG.11, the same symbols as those in FIG.9 are affixed to constituent elements corresponding to the constituent elements which have been explained with reference to FIG.9, and their explanation will be omitted. A difference between the radio paging receiver according to the sixth embodiment and radio paging receiver according to the fifth embodiment resides in that a hierarchy associated storing means 4h which stores the received messages to classify them into respective hierarchies (fields) such as sports field, weather forecast field, etc. and a hierarchy setting means 4i which

designates hierarchies (fields) to be erased are provided to the CPU 4.

In FIG.11, the hierarchy setting means 4i is a means which can set the hierarchies in which the messages are not stored in the RAM 4a (FIG.11) but erased automatically when the concerned messages are received. In this case, this setting of the hierarchies is executed according to an instruction signal issued by the user's operation of the switch portion 7.

FIG.12 is a flowchart showing an automatic message erasing process in the radio paging receiver according to the sixth embodiment of the present invention. The automatic message erasing process will be explained with reference to FIG.12 hereunder.

Under the condition of the radio paging receiver which is synchronized with the base station by turning on the power supply, the radio paging receiver decides whether or not it is at a receiving timing assigned to own radio paging receiver (step S121). Unless the radio paging receiver has been at the receiving timing in step S101, it keeps a stand-by state according to a stand-by process (step S128). In contrast, if the radio paging receiver has been at the receiving timing in step S121, it decides whether or not the messages (information) directed to own radio paging receiver are contained in the data being received from the base station (step S122). Unless the messages directed to own radio paging receiver has been contained in step S122, the radio paging receiver is shifted into the stand-by state according to the stand-by process in step S128. While, if the messages

directed to own radio paging receiver has been contained in step S122, a calling operation is started (step S123) and then the radio paging receiver decides whether or not the call-stopping operation is input by the user (step S124). Unless the call-stopping operation has been input by the user in step S124, the radio paging receiver performs a calling time-out process after a predetermined time (step S129) and then it is shifted into the stand-by state in step S128. On the contrary, if the user performs the call-stopping operation by the switch portion 7 (FIG.11) during the calling operation in step S124, the process advances to step S125 to detect whether or not the received messages belong to the designated hierarchies (fields) (step S125). Unless the received messages have belonged to the designated hierarchies in step S125, the messages are stored in the RAM 4a (FIG.11) by the message storing process (step S127) and then the process proceeds to the stand-by state (step S128). In contrast, if it is decided in step S125 that the received messages have belonged to the designated hierarchies, the messages are not stored but erased (step S126) and then the process also goes to the stand-by state (step S128). Subsequently the similar processes are repeated.

As described above, according to the radio paging receiver of the sixth embodiment of the present invention, since the radio paging receiver which can receive the messages every hierarchy is constructed to designate the hierarchies and then erase automatically the messages which are to be stored in the designated hierarchies not to store them when the concerned messages are received. Therefore, the message storage area can

be utilized effectively because there is no necessity to store the messages which need the check only once at the time of calling.

The similar advantage can be achieved by designating the receiving addresses in place of the designation of the hierarchies.

Seventh Embodiment

A seventh embodiment of the present invention corresponds to a radio paging receiver which can erase collectively the concerned messages if the designated character sequences are contained in the stored messages.

FIG.13 is a block diagram showing a circuit configuration of the radio paging receiver according to the seventh embodiment of the present invention. In FIG.13, the same symbols as those in FIG.1 are affixed to constituent elements corresponding to the constituent elements which have been explained with reference to FIG.1, and their explanation will be omitted. A difference between the radio paging receiver according to the seventh embodiment and radio paging receiver according to the first embodiment resides in that a stored character sequence retrieving means 4p which can retrieve whether or not the designated character sequences are contained in the messages stored in the CPU 4 and a batch erasing means 4q which can erase collectively the messages containing the designated character sequences are provided to the CPU 4. In this case, the setting of the character sequences by the character sequence designating means and the batch erase of the messages containing the designated character sequences by the batch erasing means 4q are executed according to an instruction

signal issued by the user's operation of the switch portion 7.

FIG.14 is a flowchart showing an automatic message erasing process in the radio paging receiver according to the seventh embodiment of the present invention. The automatic message erasing process will be explained with reference to FIG.14 hereunder.

Under the condition of the radio paging receiver which is synchronized with the base station by turning on the power supply, the radio paging receiver decides whether or not it is at a receiving timing assigned to own radio paging receiver (step S141). Unless the radio paging receiver has been at the receiving timing in step S141, it keeps a stand-by state according to a stand-by process (step S146). In contrast, if the radio paging receiver has been at the receiving timing in step S141, it decides whether or not the messages (information) directed to own radio paging receiver are contained in the data being received from the base station (step S142). Unless the message directed to own radio paging receiver has been contained in step S142, the radio paging receiver is shifted into the stand-by state according to the stand-by process in step S146. If the message directed to own radio paging receiver has been contained in step S142, a calling operation is started (step S143) and then the radio paging receiver waits whether or not the call-stopping operation is input by the user (step S144). Unless the call-stopping operation has been input by the user in step S144, the radio paging receiver performs a calling time-out process after a predetermined time (step S14b) and then it is shifted into the stand-by state in step

S146. In contrast, if the user performs the call-stopping operation by the switch portion 7 (FIG.13) during the calling operation in step S144, the messages are stored in the RAM 4a (FIG.13) by the message storing process (step S145) and then the process goes to the stand-by state according to the stand-by process (step S146). During the stand-by state, it is detected whether or not the batch erasing operation of the designated character sequences is executed by the user (step S147). Unless the batch erasing operation of the designated character sequences has been executed by the user in step S147, the processes from step S141 to step S147 are executed repeatedly. If the batch erasing operation of the designated character sequences has been executed by the user in step S147 during the stand-by state, the designated character sequences contained in the messages stored in the RAM 4a (FIG.13) are retrieved by using the stored character sequence retrieving means 4p (FIG.13) (step S148) and then the messages containing the designated character sequences are listed up (step S149). Then, it is decided whether or not the concerned messages are detected (S150). If it is decided in step S150 that no concerned message has been detected, the processes from step S141 to step S147 are executed repeatedly. If it is decided in step S150 that the messages containing the designated character sequences have been detected, all the messages containing the designated character sequences are erased by using the batch erasing means 4q (FIG.13) (step S14a).

As described above, according to the radio paging receiver of the seventh embodiment of the present invention, since

the radio paging receiver is constructed to erase the concerned messages collectively when the designated character sequences are contained in the stored messages, complicatedness in erasing the messages unnecessary for the user can be reduced.

5 The similar advantage can be achieved if the character sequences are set by inputting the characters by using the switch portion 7 unless they are designated from the stored messages.

Eighth Embodiment

10 A eighth embodiment of the present invention corresponds to a radio paging receiver which can erase collectively the concerned messages if the designated character sequences are contained in the messages having the designated addresses.

15 FIG.15 is a block diagram showing a circuit configuration of the radio paging receiver according to the eighth embodiment of the present invention. In FIG.15, the same symbols as those in FIG.13 are affixed to constituent elements corresponding to the constituent elements which have been explained with reference to FIG.13, and their explanation will be omitted. A difference between the radio paging receiver according to the eighth
20 embodiment and radio paging receiver according to the seventh embodiment resides in that the address associated storing means 4f which can store the messages according to respective addresses received by the CPU 4, the address setting means 4g which can set the addresses by which the character sequences are to be retrieved,
25 and the messages containing the designated character sequences are provided to the CPU 4. In this case, the setting of the character sequences by the character sequence designating means

4b, the setting of the address to be erased collectively, and the batch erase of the messages containing the designated character sequences by the batch erasing means 4q are executed according to an instruction signal issued by the user's operation of the switch portion 7.

FIG.16 is a flowchart showing an automatic message erasing process in the radio paging receiver according to the eighth embodiment of the present invention. The automatic message erasing process will be explained with reference to FIG.16 hereunder.

Under the condition of the radio paging receiver which is synchronized with the base station by turning on the power supply, the radio paging receiver decides whether or not it is at a receiving timing assigned to own radio paging receiver (step S161). Unless the radio paging receiver has been at the receiving timing in step S161, it keeps a stand-by state according to a stand-by process (step S166). In contrast, if the radio paging receiver has been at the receiving timing in step S161, it decides whether or not the messages (information) directed to own radio paging receiver are contained in the data being received from the base station (step S162). Unless the message directed to own radio paging receiver has been contained in step S162, the radio paging receiver is shifted into the stand-by state according to the stand-by process in step S166. If the message directed to own radio paging receiver has been contained in step S162, a calling operation is started (step S163) and then the radio paging receiver waits whether or not the call-stopping operation is input

by the user (step S164). Unless the call-stopping operation has been input by the user in step S164, the radio paging receiver performs a calling time-out process after a predetermined time (step S16b) and then it is shifted into the stand-by state in step
5 S166. In contrast, if the user performs the call-stopping operation by the switch portion 7 (FIG.15) during the calling operation in step S164, the process goes to step S165.

Then, the messages are stored in the RAM 4a (FIG.15) by the message storing process (step S165) and then the process goes
10 to the stand-by state according to the stand-by process (step S166).

During the stand-by state, it is detected whether or not the batch erasing operation of the designated character sequences is executed by the user (step S167). Unless the batch erasing operation of the designated character sequences has been executed
15 by the user in step S167, the processes from step S161 to step S167 are executed repeatedly. In contrast, if the batch erasing operation of the designated character sequences has been executed by the user in step S167 during the stand-by state, the designated character sequences contained in the messages, which are stored
20 in the RAM 4a (FIG.15) and have the addresses being set by the address setting means 4g (FIG.15), are retrieved from the messages whose received addresses are identified, by using the character sequence retrieving means 4c (FIG.15) (step S168), and then the messages containing the designated character sequences are listed
25 up (step S169). Then, it is decided whether or not the concerned messages are detected from the designated addresses (S170). If it is decided in step S170 that no concerned message has been

detected from the designated addresses, the processes from step S161 to step S167 are executed repeatedly. If it is decided in step S170 that the messages containing the designated character sequences have been detected from the designated addresses, all
5 the messages containing the designated character sequences are erased from the designated addresses by using the batch erasing means 4q (FIG.15) (step S16a).

As described above, according to the radio paging receiver of the eighth embodiment of the present invention, since
10 the radio paging receiver is constructed to erase the concerned messages collectively when the designated character sequences are contained in the messages having the designated addresses, complicatedness in erasing the messages unnecessary for the user can be reduced.

15 When any hierarchies are set in place of the received addresses and then the messages to be stored in the hierarchies are received after the any hierarchies have been set, the similar advantage can be achieved by erasing automatically the concerned messages not to store them.

20 The above radio paging receiver may be employed singly, but such radio paging receiver may be employed in combination with the mobile telephone, etc.

As described above, according to the present invention, the radio paging receiver comprises the character sequence
25 designating means for designating character sequences in stored messages, the character sequence retrieving means for detecting whether or not designated character sequences are contained in

stored messages, the time counting means for monitoring whether or not a predetermined time has lapsed after the messages are stored; and the erasing means for erasing the stored messages from a storage area. Therefore, there can be achieved such an advantage that concerned messages can be erased automatically after the predetermined time has lapsed, and thus complicatedness in erasing the unnecessary messages can be reduced.

Also, the radio paging receiver comprises a character sequence inputting means, the character sequence retrieving means, the time counting means, and the erasing means. Therefore, there can be achieved such an advantage that the messages containing designated character sequences can be erased automatically after a predetermined time has been lapsed, and thus complicatedness in erasing the unnecessary messages can be reduced.

Also, the radio paging receiver comprises the address associated storing means for storing the message data picked up by the first decoding means every calling address, the address setting means for designating the calling addresses as objects of erasure by time counting, the time counting means, and the erasing means. Therefore, there can be achieved such an advantage that the messages having the addresses designated can be erased automatically after a predetermined time has been lapsed and thus complicatedness in erasing the messages having a low degree of importance can be reduced.

Also, the radio paging receiver comprises the hierarchy associated storing means for storing the message data which are picked up by the second decoding means every hierarchy, the

hierarchy setting means for designating hierarchies as objects
of erasure by time counting, the time counting means, and the
erasing means. Therefore, there can be achieved such an advantage
that the messages belonging to the hierarchies can be erased
5 automatically after a predetermined time has been lapsed and thus
complicatedness in erasing the messages belonging to hierarchies
having a low degree of importance can be reduced.

Also, the radio paging receiver comprises the time
setting means for inputting times as timings for erasure of the
10 messages by a user, the time monitoring means for monitoring
whether or not a time coincides with an input time, and the erasing
means. Therefore, there can be achieved such an advantage that
the messages can be erased periodically and thus complicatedness
in erasing the unnecessary messages can be reduced.

15 Also, the radio paging receiver comprises the day-of-
the-week setting means for inputting a day of the week, the
day-of-the-week monitoring means for monitoring whether or not
a day of the week coincides with an input day of the week; and
the erasing means. Therefore, there can be achieved such an
20 advantage that the messages can be erased periodically at
respective days of the week and thus complicatedness in erasing
the unnecessary messages can be reduced.

Also, the radio paging receiver comprises the character
sequence designating means for designating character sequences
25 in stored messages, the received character sequence retrieving
means for detecting whether or not designated character sequences
are contained in received messages, and the erasing means for

erasing the messages. Therefore, there can be achieved such an advantage that the messages cannot be stored in the storage area but can be erased after the messages have been checked when designated character sequences are contained in the received
5 messages, so that the message storage area can be utilized effectively because there is no necessity to store the messages in the message storage area.

Also, the radio paging receiver comprises the character sequence inputting means, the character sequence retrieving means,
10 and the erasing means. Therefore, there can be achieved such an advantage that the character sequences which are retrieved to erase messages can be input by the character sequence inputting means, so that the message storage area can be utilized effectively because there is no necessity to store the messages in the message
15 storage area.

Also, the radio paging receiver comprises the storing means for storing the message data which are picked up by the second decoding means every address, the address setting means for designating addresses as objects of erasure at a time of reception,
20 and the erasing means. Therefore, there can be achieved such an advantage that the messages related to particular addresses cannot be stored in the storage area but can be erased, so that the message storage area can be utilized effectively.

Also, the radio paging receiver comprises the second
25 storing means for storing the message data which are picked up by the third decoding means every hierarchy, the hierarchy setting means for designating hierarchies as objects of erasure, and the

erasing means. Therefore, there can be achieved such an advantage that the messages belonging to particular hierarchies cannot be stored in the storage area but can be erased, so that the message storage area can be utilized effectively.

5 Also, the radio paging receiver comprises the character sequence designating means for designating character sequences in stored messages, the stored character sequence retrieving means for detecting whether or not designated character sequences are contained in stored messages, and the erasing means for erasing
10 the messages. Therefore, there can be achieved such an advantage that the messages can be erased collectively and thus complicatedness in erasing the unnecessary messages can be reduced.

 Also, the radio paging receiver comprises the character
15 sequence inputting means, the character sequence retrieving means, and the erasing means. Therefore, there can be achieved such an advantage that the messages containing the character sequences can be erased collectively and thus complicatedness in erasing the unnecessary messages can be reduced and operability can be
20 enhanced.

 Also, the radio paging receiver comprises the first storing means for storing the message data which are picked up by the second decoding means every address, the address setting means for designating addresses as objects of erasure according
25 to character sequence conditions, and the erasing means. Therefore, there can be achieved such an advantage that the messages containing the designated character sequences having

particular addresses can be erased collectively and thus complicatedness in erasing the unnecessary messages can be reduced and also operability can be enhanced.

Also, the radio paging receiver comprises the second
5 storing means for storing the message data which are picked up by the third decoding means every hierarchy, the hierarchy setting means for designating hierarchies as objects of erasure according to character sequence conditions, and the erasing means.

Therefore, there can be achieved such an advantage that the
10 messages belonging to particular hierarchies can be erased collectively when the messages contain designated character sequences and thus complicatedness in erasing the unnecessary messages can be reduced and also erasing operability can be enhanced.

WHAT IS CLAIMED IS:

1. A radio paging receiver comprising:

receiving means for receiving a radio signal from a base station of a radio paging system;

5 holding means for holding at least of calling address assigned to own receiver;

first decoding means for picking up message data corresponding to the calling address or the calling addresses from the radio signal;

10 data storing means for storing the message data;

character sequence designating means for designating character sequences in stored messages;

15 character sequence retrieving means for detecting whether or not designated character sequences are contained in stored messages;

time counting means for monitoring whether or not a predetermined time has lapsed after the messages are stored;

erasing means for erasing the stored messages from a storage area; and

20 first controlling means for causing the erasing means to erase concerned messages when it is detected by the character sequence retrieving means that the designated character sequences are contained in the stored messages and it is detected by the time counting means that the predetermined time has lapsed after
25 the messages are stored.

2. A radio paging receiver according to claim 1,

further comprising a character sequence inputting means for inputting character sequences which are retrieved to erase messages.

5 3. A radio paging receiver according to claim 1, further comprising:

 address associated storing means for storing the message data picked up by the first decoding means every calling address;

 address setting means for designating the calling
10 addresses as objects of erasure by time counting; and

 second controlling means for causing the erasing means to erase the messages based on signals from the address setting means and the time counting means.

15 4. A radio paging receiver according to claim 1, further comprising:

 second decoding means for picking up message data which are classified into a hierarchical structure and transmitted to own address;

20 hierarchy associated storing means for storing the message data which are picked up by the second decoding means every hierarchy; and

 hierarchy setting means for designating hierarchies as objects of erasure by time counting;

25 wherein erasure of the messages is effected by the hierarchy setting means and the time counting means.

5. A radio paging receiver according to any one of claims 1 to 4, further comprising:

time setting means for inputting times as timings for erasure of the messages by a user; and

5 time monitoring means for monitoring whether or not a time coincides with an input time;

wherein the erasure of the messages is effected periodically at respective times which are input by the user.

10 6. A radio paging receiver according to any one of claims 1 to 4, further comprising:

day-of-the-week setting means for inputting a day of the week as timings for erasure of the messages by a user; and

15 day-of-the-week monitoring means for monitoring whether or not a day of the week coincides with an input day of the week;

wherein the erasure of the messages is effected periodically at respective days of the week which are input by the user.

20 7. A radio paging receiver comprising:

receiving means for receiving a radio signal from a base station of a radio paging system;

first decoding means for picking up one calling address or a plurality of calling addresses assigned to own receiver from
25 the radio signal received by the receiving means and also picking up message data corresponding to the calling address or the calling addresses;

data storing means for storing the message data picked up by the first decoding means;

holding means for holding at least of calling address assigned to own receiver;

5 character sequence designating means for designating character sequences in stored messages;

received character sequence retrieving means for detecting whether or not designated character sequences are contained in received messages; and

10 erasing means for erasing the messages;

wherein, when designated character sequences are contained in the received messages, the messages are not stored in a storage area but erased after the messages have been checked.

15 8. A radio paging receiver according to claim 7, further comprising character sequence inputting means for inputting character sequences which are retrieved to erase messages.

20 9. A radio paging receiver according to claim 7, further comprising:

second decoding means for picking up a plurality of calling addresses assigned to own receiver and picking up message data which are transmitted to own address;

25 storing means for storing the message data which are picked up by the second decoding means every address; and address setting means for designating addresses as

objects of erasure at a time of reception;

wherein the messages related to particular addresses are not stored in the storage area, but erased after the messages have been checked.

5

10. A radio paging receiver according to claim 7, further comprising:

third decoding means for picking up message data which are classified into a hierarchical structure and transmitted to
10 own address;

second storing means for storing the message data which are picked up by the third decoding means every hierarchy; and

hierarchy setting means for designating hierarchies as objects of erasure at a time of reception;

15

wherein the messages belonging to particular hierarchies are not stored in the storage area, but erased after the messages have been checked.

11. A radio paging receiver comprising:

20

receiving means for receiving a radio signal from a base station of a radio paging system;

first decoding means for picking up one calling address or a plurality of calling addresses assigned to own receiver from the radio signal received by the receiving means and also picking
25 up message data corresponding to the calling address or the calling addresses;

data storing means for storing the message data picked

up by the first decoding means;

holding means for holding at least of calling address assigned to own receiver;

character sequence designating means for designating
5 character sequences in stored messages;

stored character sequence retrieving means for detecting whether or not designated character sequences are contained in stored messages; and

erasing means for erasing the messages;

10 wherein, when designated character sequences are contained in the stored messages, the messages are erased collectively concerned messages.

12. A radio paging receiver according to claim 11,
15 further comprising a character sequence inputting means for inputting character sequences which are retrieved to erase collectively messages.

13. A radio paging receiver according to claim 11 or
20 claim 12, further comprising:

a second decoding means for picking up a plurality of calling addresses assigned to own receiver and picking up message data which are transmitted to own address;

a first storing means for storing the message data which
25 are picked up by the second decoding means every address; and

an address setting means for designating addresses as objects of erasure according to character sequence conditions;

wherein the messages related to particular addresses can be erased collectively when the messages contain designated character sequences.

5 14. A radio paging receiver according to claim 11 or claim 12, further comprising:

 third decoding means for picking up message data which are classified into a hierarchical structure and transmitted to own address;

10 second storing means for storing the message data which are picked up by the third decoding means every hierarchy; and

 hierarchy setting means for designating hierarchies as objects of erasure according to character sequence conditions;

15 wherein the messages belonging to particular hierarchies can be erased collectively when the messages contain designated character sequences.

 15. A message erasing method comprising the steps of:
 receiving a radio signal from a base station of a radio
20 paging system;

 picking up one calling address or a plurality of calling addresses assigned to own receiver from received radio signal;

 picking up message data corresponding to the calling address or the calling addresses;

25 storing message data being picked up;

 designating character sequences in stored messages;

 detecting whether or not designated character sequences

are contained in stored messages;

monitoring whether or not a predetermined time has lapsed after the messages have been stored; and

erasing concerned messages if designated character sequences are contained in the stored messages and it is detected by the time counting means that the predetermined time has lapsed after the messages are stored.

16. A message erasing method according to claim 15, wherein erasure of the messages is effected by inputting character sequences, which are retrieved to erase messages, via a character sequence inputting means.

17. A message erasing method according to claim 15, wherein the message data being picked up are stored every calling address, the calling addresses as objects of erasure by time counting are designated, and the erasure of the messages is effected by the addresses and the time counting.

18. A message erasing method according to claim 15, wherein message data which are classified into a hierarchical structure and transmitted to own address are picked up, the message data which are picked up are stored every hierarchy, hierarchies acting as objects of erasure by time counting are designated, and erasure of the messages is effected by the hierarchy setting and the time counting.

19. A message erasing method according to any one of claims 15 to 18, wherein times as timings for erasure of the messages are input by a user, it is monitored whether or not a time coincides with an input time, and the erasure of the messages
5 is effected periodically at respective times which are input by the user.

20. A message erasing method according to any one of claims 15 to 18, wherein a day of the week acting as timings for
10 erasure of the messages is input by a user, it is monitored whether or not a day of the week coincides with an input day of the week, and the erasure of the messages is effected periodically at respective days of the week which are input by the user.

21. A message erasing method comprising the steps of:
15 receiving a radio signal from a base station of a radio paging system;

picking up one calling address or a plurality of calling addresses assigned to own receiver from the radio signal received;

20 picking up message data corresponding to the calling address or the calling addresses;

storing the message data being picked up;

designating character sequences in stored messages;

25 detecting whether or not designated character sequences are contained in received messages; and

erasing the messages not to store in a storage area after the messages have been checked when designated character

sequences are contained in the received messages.

22. A message erasing method according to claim 21,
wherein character sequences which are retrieved to erase messages
5 are input via a character sequence inputting means.

23. A message erasing method according to claim 21,
wherein a plurality of calling addresses assigned to own receiver
are picked up, message data which are transmitted to own address
10 are picked up, the message data which are picked up by the second
decoding means are stored every address, addresses as objects of
erasure at a time of reception are designated, and the messages
related to particular addresses are not stored in the storage area
but erased after the messages have been checked.

15 24. A message erasing method according to claim 21,
wherein message data which are classified into a hierarchical
structure and transmitted to own address are picked up, the message
data which are picked up by the third decoding means are stored
20 every hierarchy, hierarchies acting as objects of erasure at a
time of reception are designated, and the messages belonging to
particular hierarchies are not stored in the storage area but
erased after the messages have been checked.

25 25. A message erasing method comprising the steps of:
receiving a radio signal from a base station of a radio
paging system;

picking up one calling address or a plurality of calling addresses assigned to own receiver from the radio signal being received;

5 picking up message data corresponding to the calling address or the calling addresses,
storing the message data picked up;
designating character sequences in stored messages;
detecting whether or not designated character sequences are contained in stored messages; and
10 erasing concerned messages collectively when designated character sequences are contained in the stored messages.

26. A message erasing method according to claim 25, wherein character sequences which are retrieved to erase
15 collectively messages are input via a character sequence inputting means.

27. A message erasing method according to claim 25 or claim 26, wherein a plurality of calling addresses assigned to
20 own receiver are picked up, message data which are transmitted to own address are picked up, the message data which are picked up are stored every address, addresses acting as objects of erasure are designated according to character sequence conditions, and
the messages related to particular addresses can be erased
25 collectively when the messages contain designated character sequences.

28. A message erasing method according to claim 25 or claim 26, wherein message data which are classified into a hierarchical structure and transmitted to own address are picked up, the message data which are picked up are stored every hierarchy, hierarchies as objects of erasure are designated according to character sequence conditions, and the messages belonging to particular hierarchies can be erased collectively when the messages contain designated character sequences.

10 29. A radio equipment comprising a radio transmitter/receiver and a radio paging receiver set forth in claims 1 to 4, and 7 to 12.

551120 360000

Message data are picked up by using a decoder 2 from received signals received by a receiver portion 1 of a radio paging receiver, and stored in a RAM 4a of a CPU 4. An informing portion

9 informs a user of the message. The user designates any character sequences in the message stored in the RAM 4a by a character sequence designating unit 4b. A character sequence retrieving unit 4c retrieves whether or not designated character sequences are contained in stored messages. When the messages containing the designated character sequences are detected, a time counting unit 4d monitors whether or not a predetermined time has been lapsed after storage of concerned messages. An erasing unit 4e erases unnecessary messages stored in the RAM 4a from the RAM 4a after the predetermined time has been lapsed. Accordingly, the messages which are transmitted periodically and repeatedly to the radio paging receiver can be erased collectively and automatically and thus complicatedness in erasing the messages can be eliminated and also operability can be enhanced.

FIG. 1

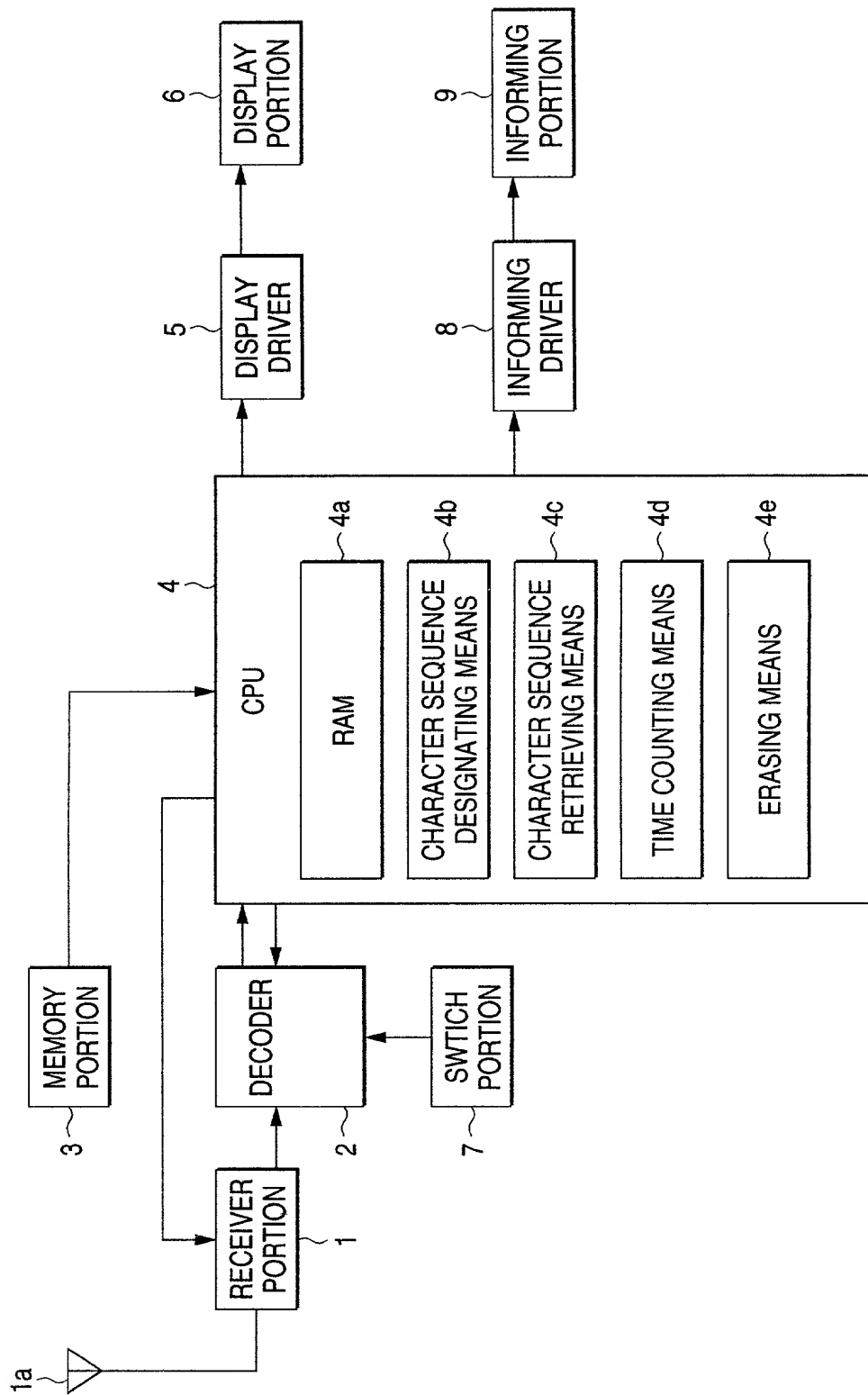


FIG. 2

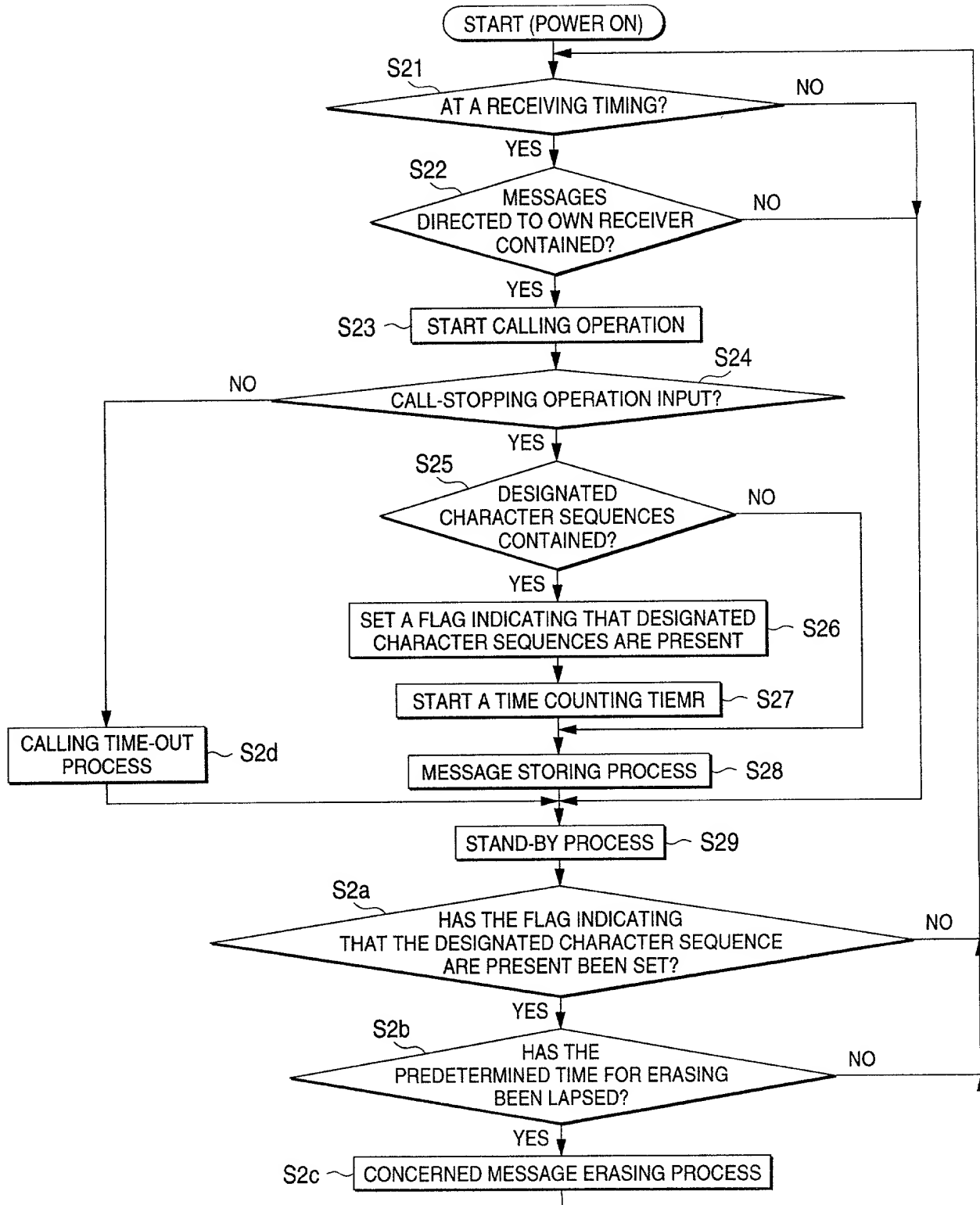


FIG. 3

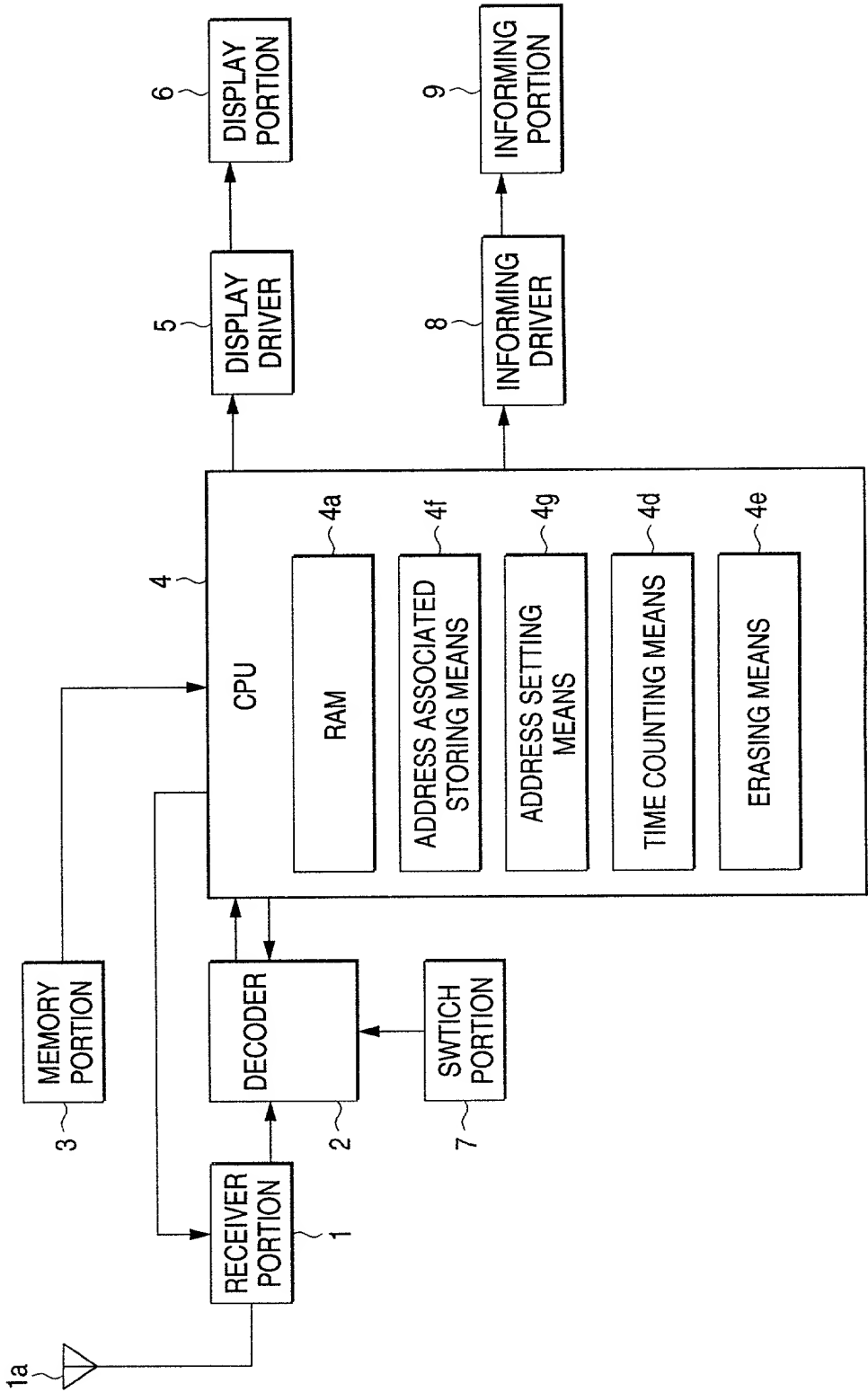


FIG. 4

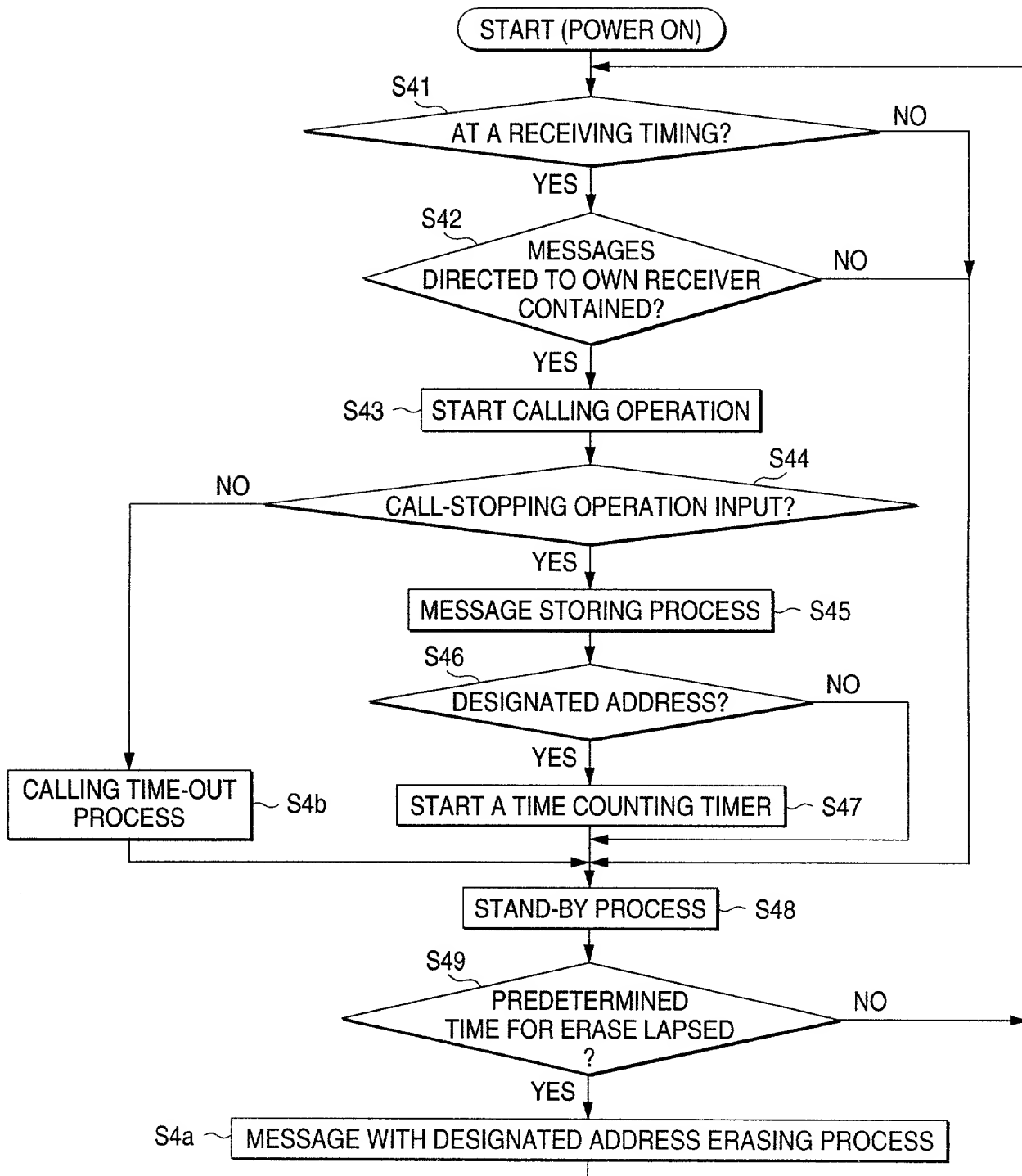


FIG. 5

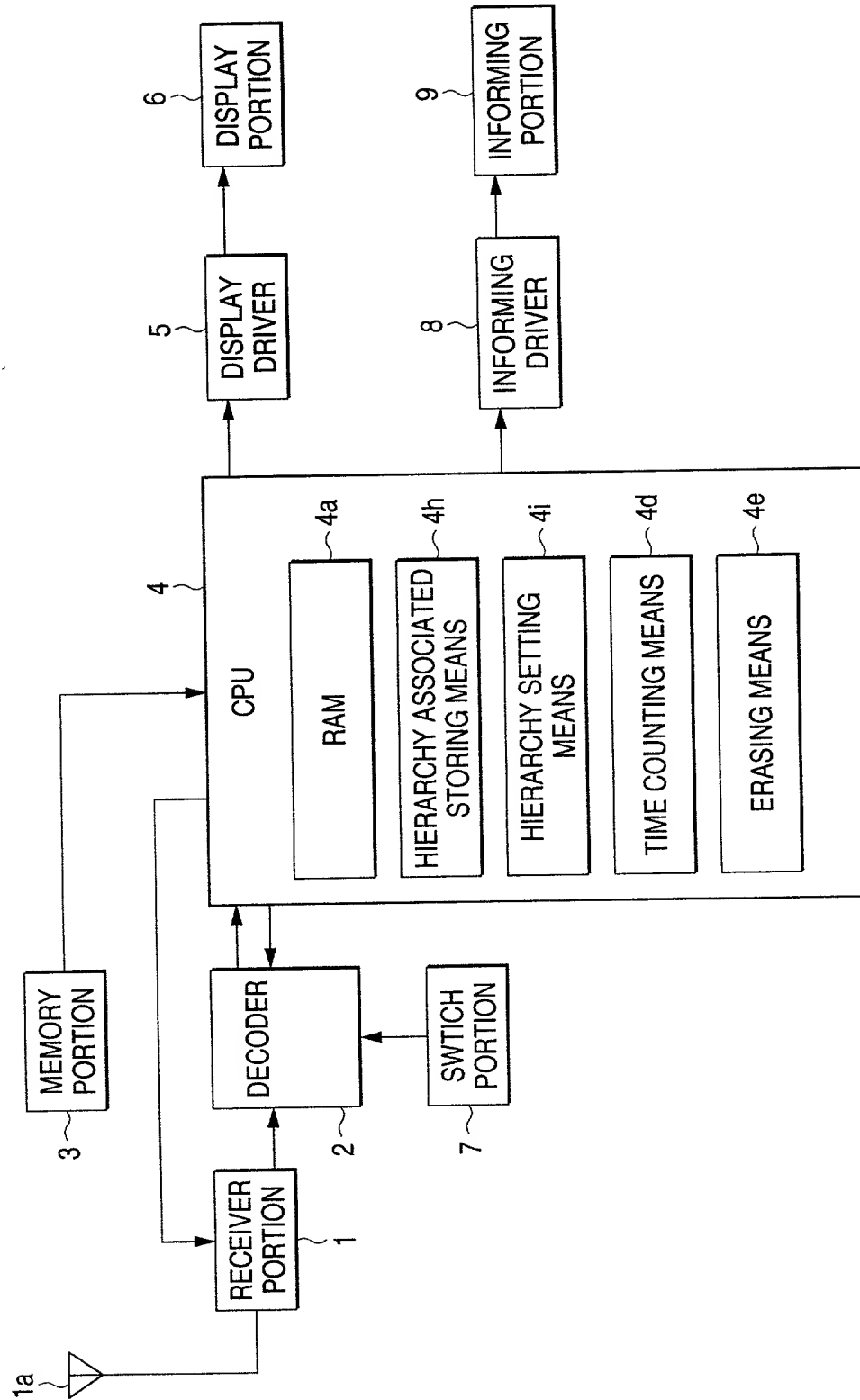


FIG. 6

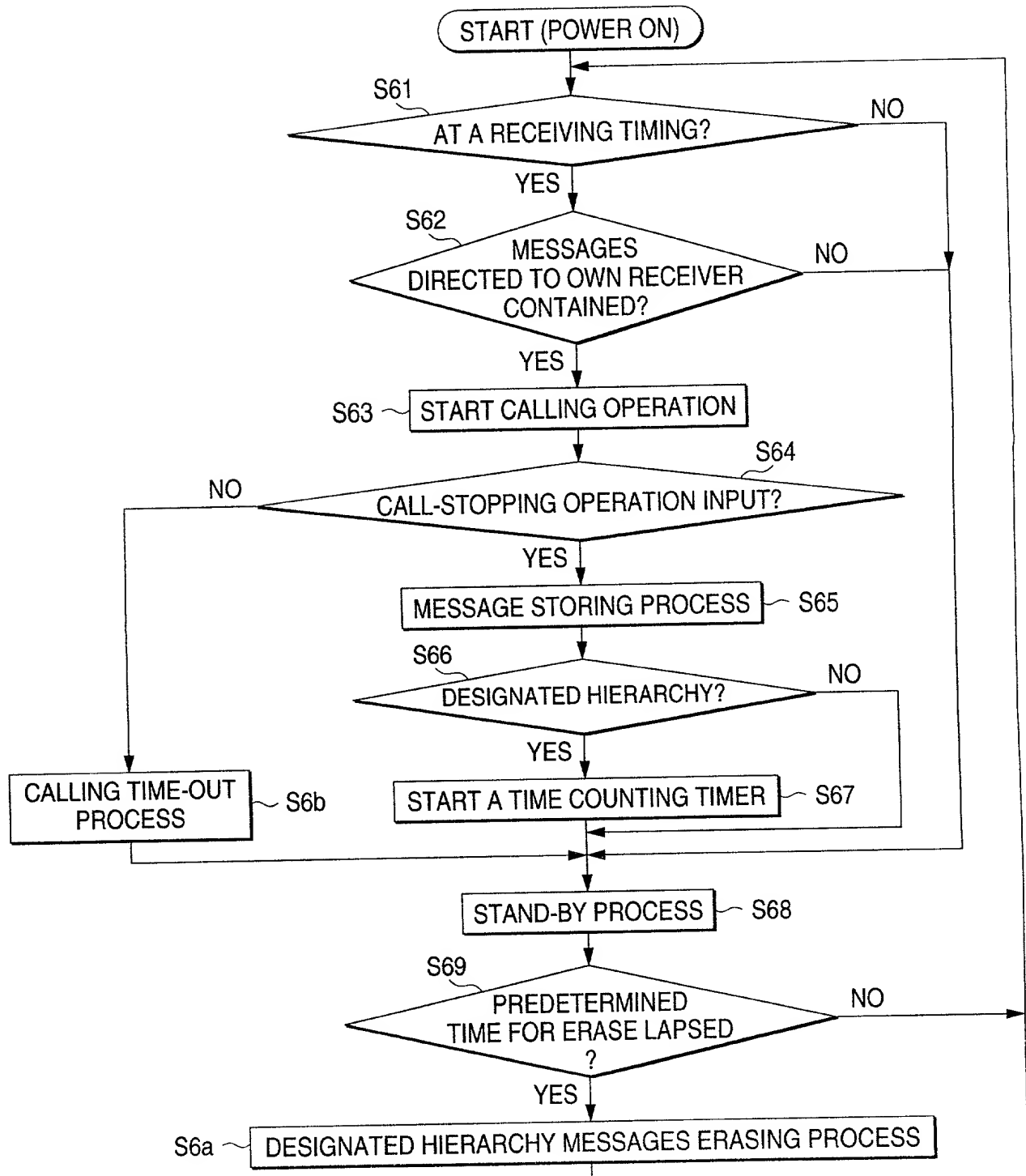


FIG. 7

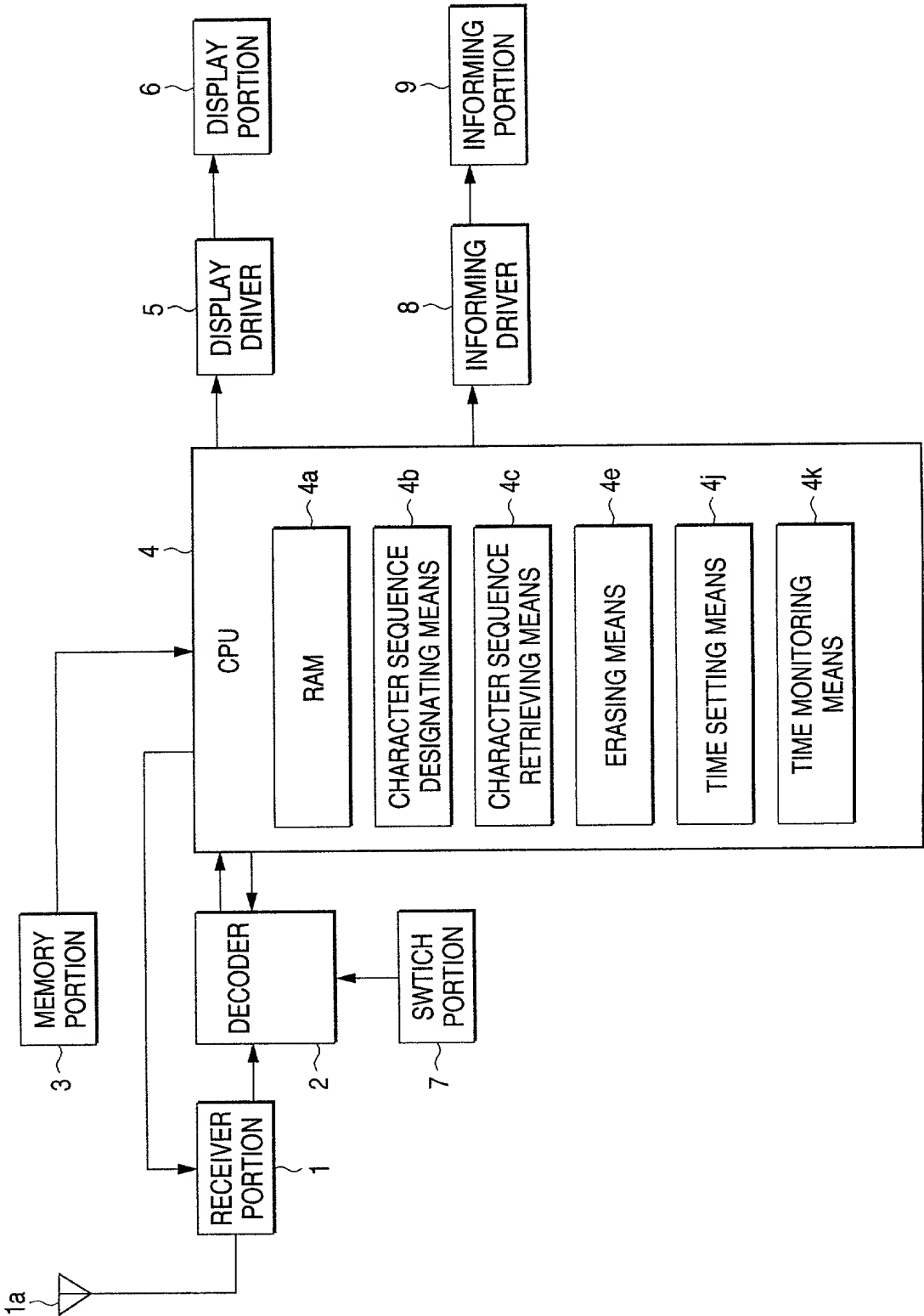


FIG. 8

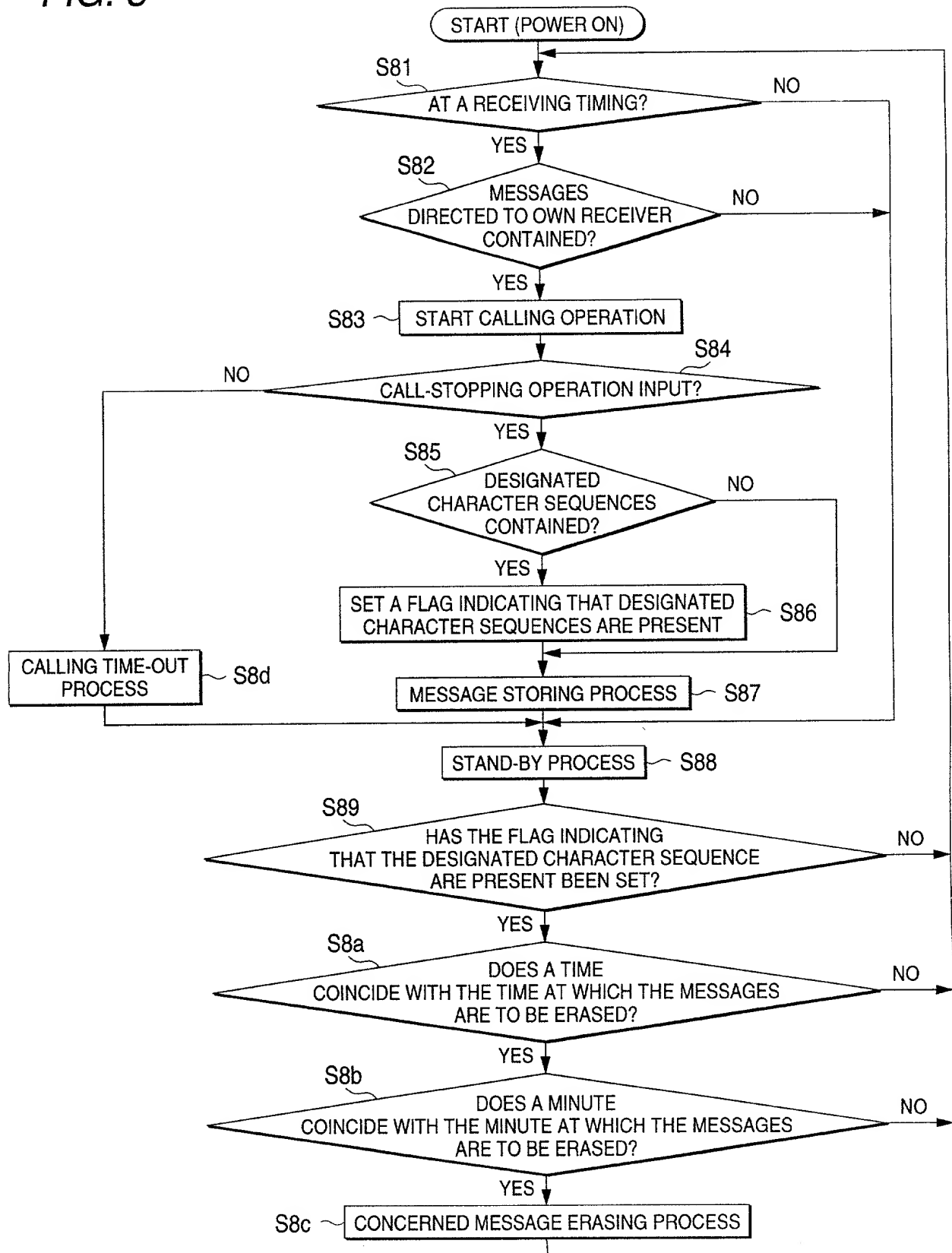


FIG. 9

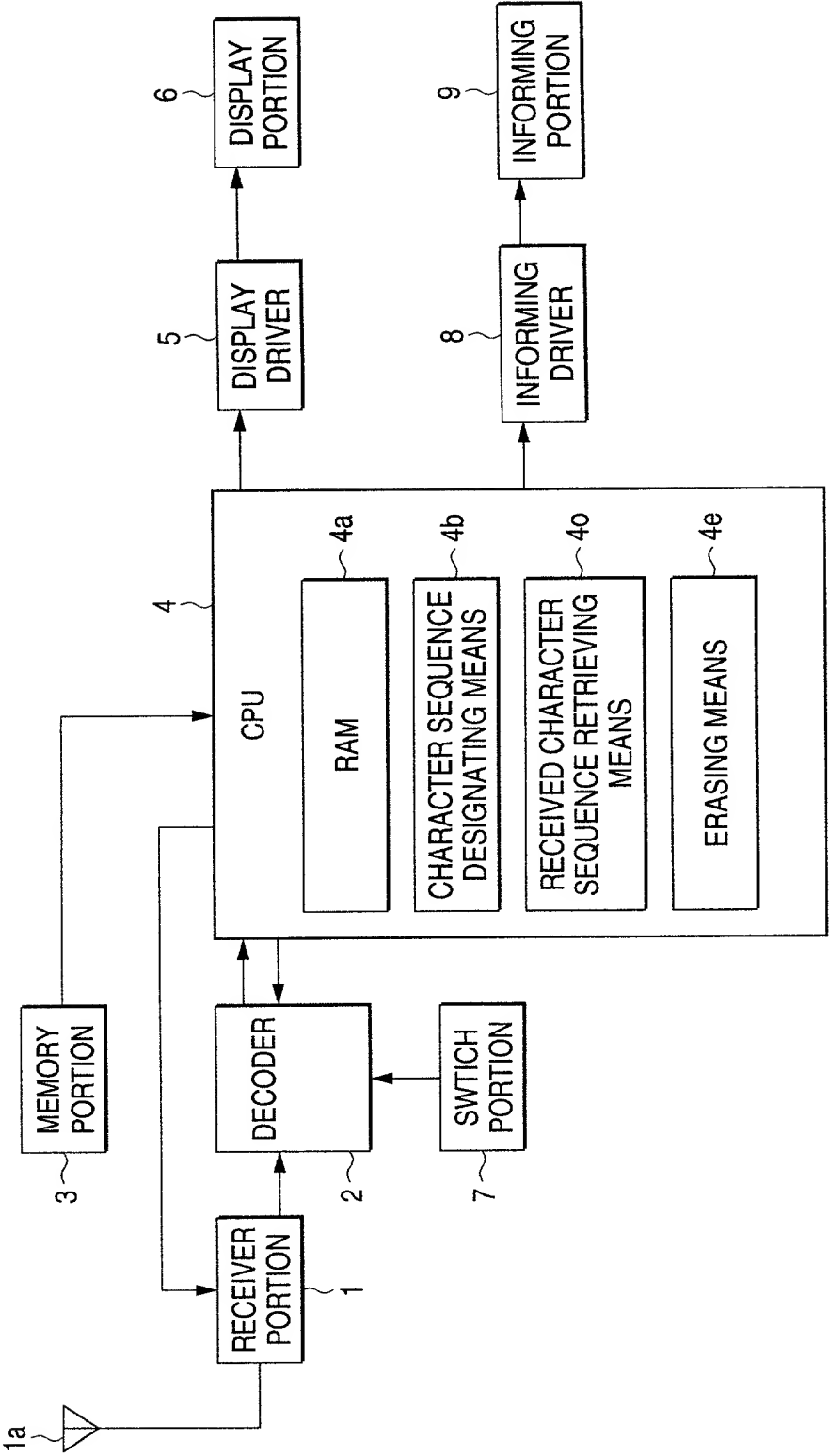


FIG. 10

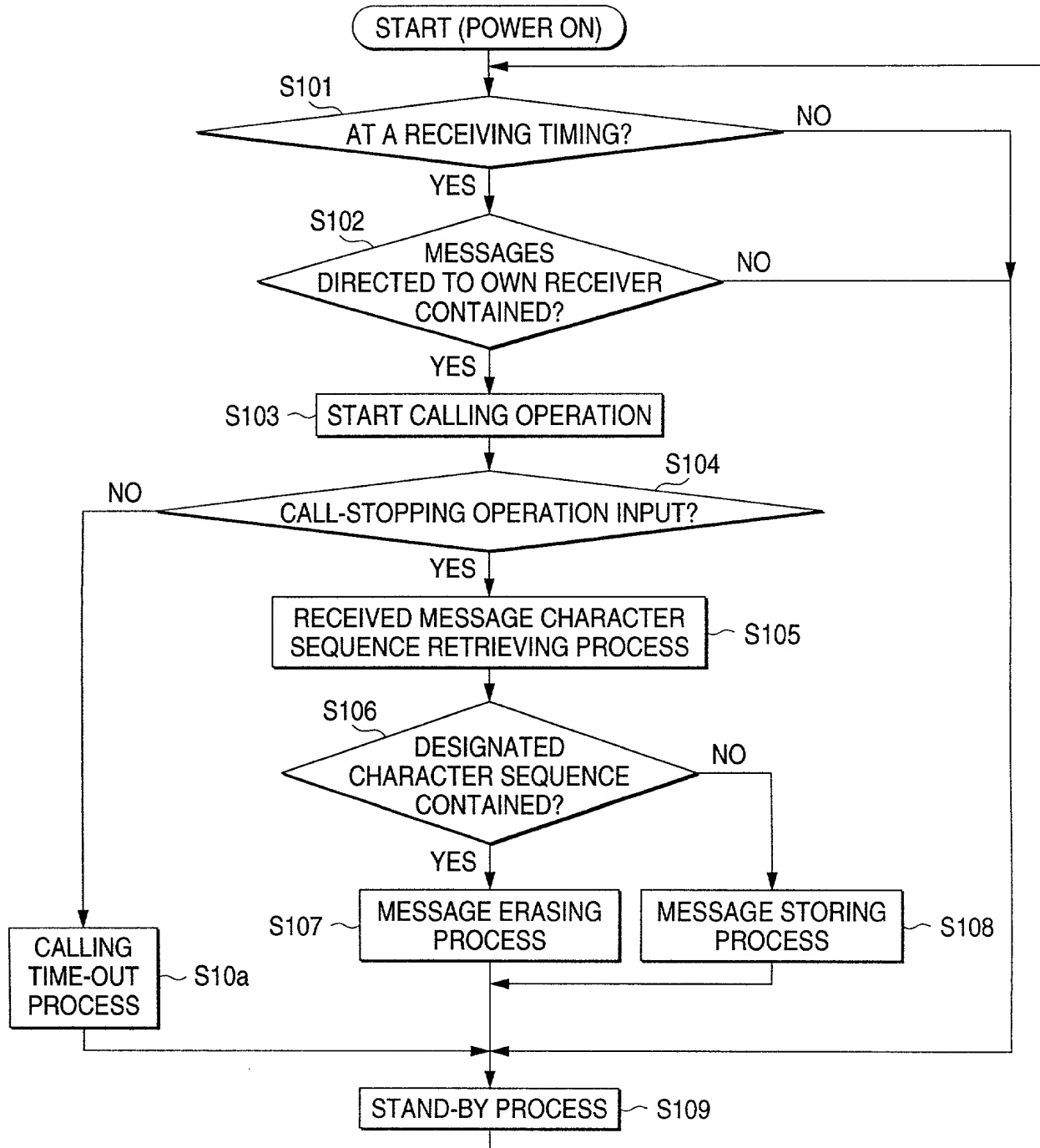


FIG. 11

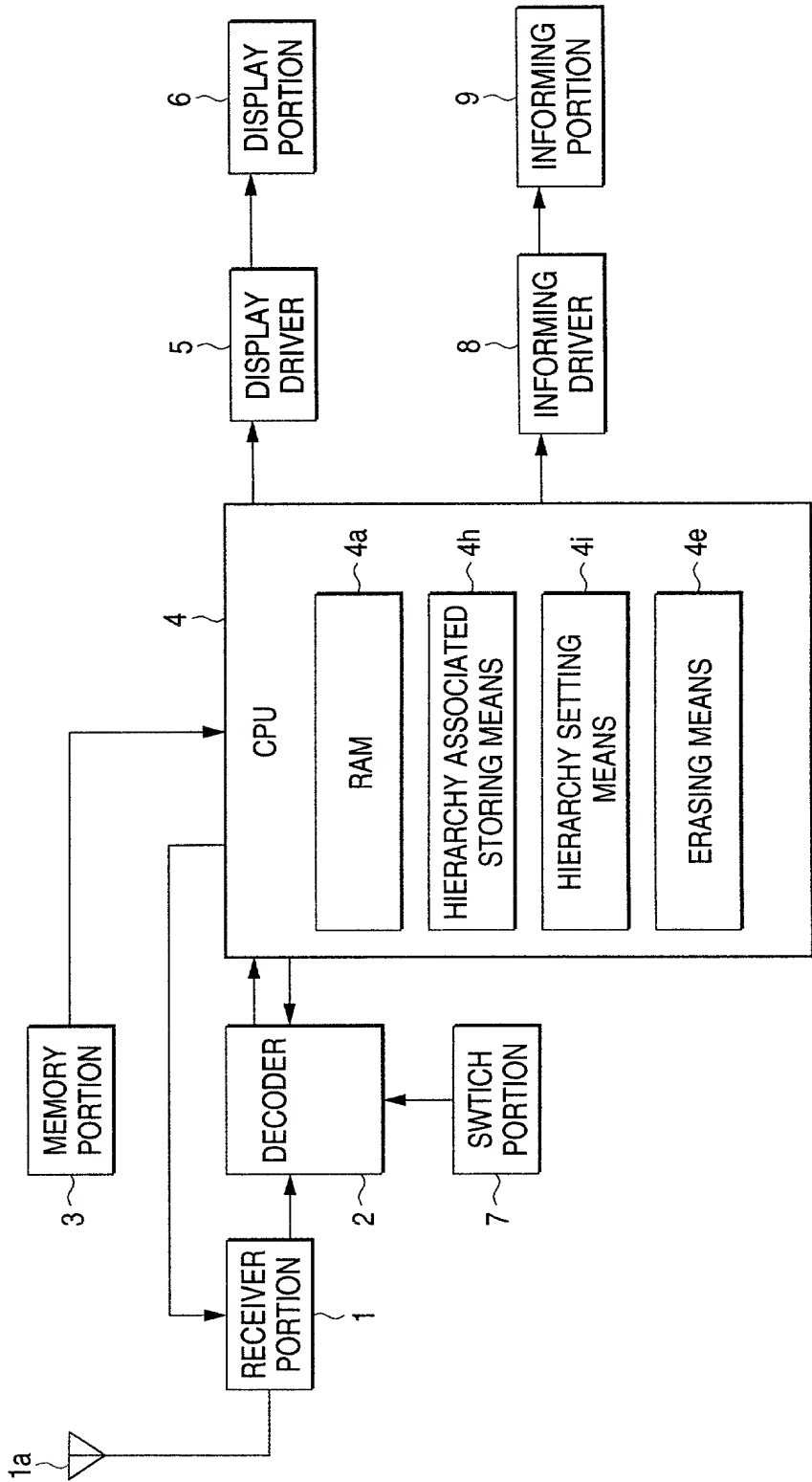


FIG. 12

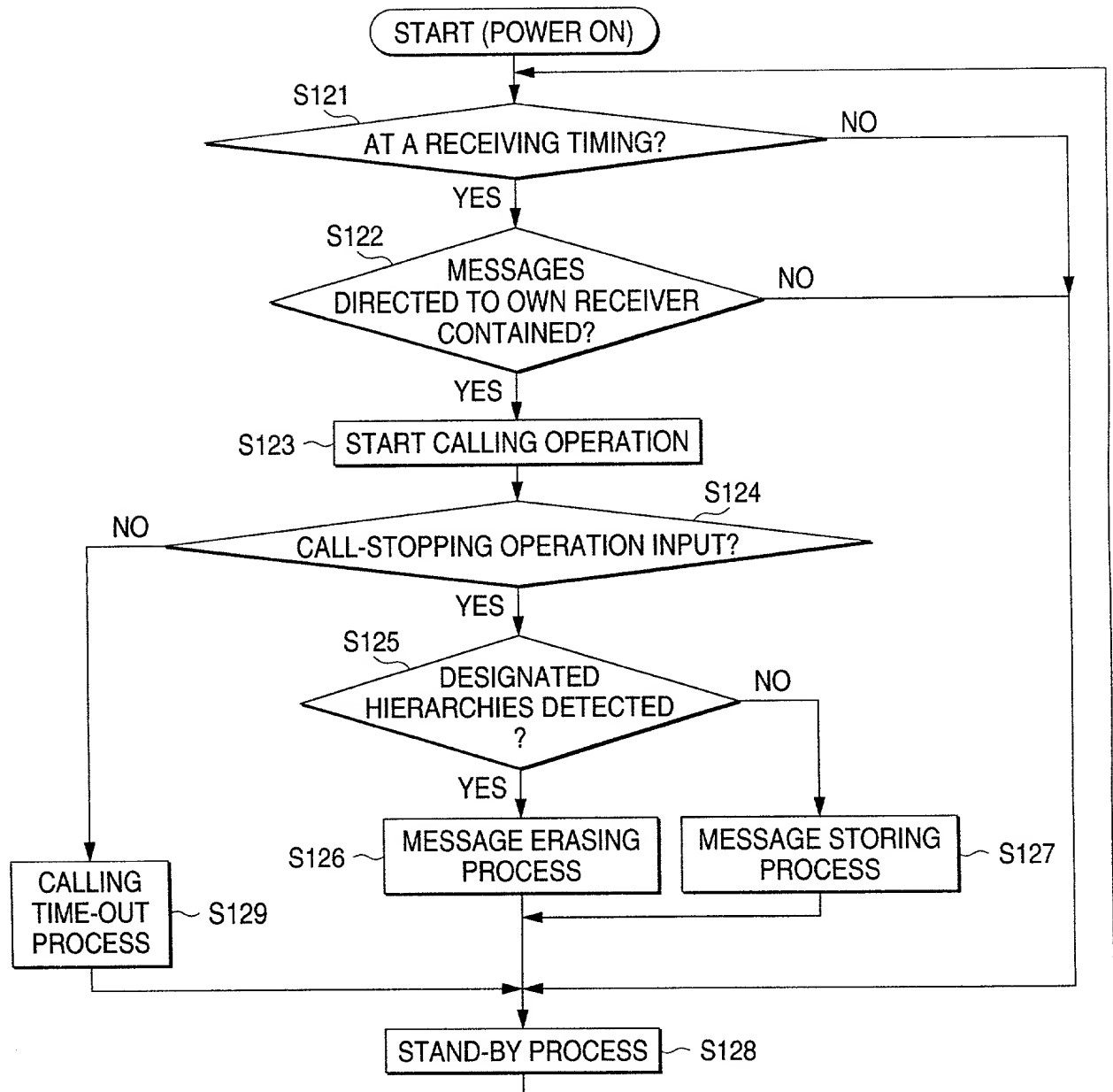


FIG. 13

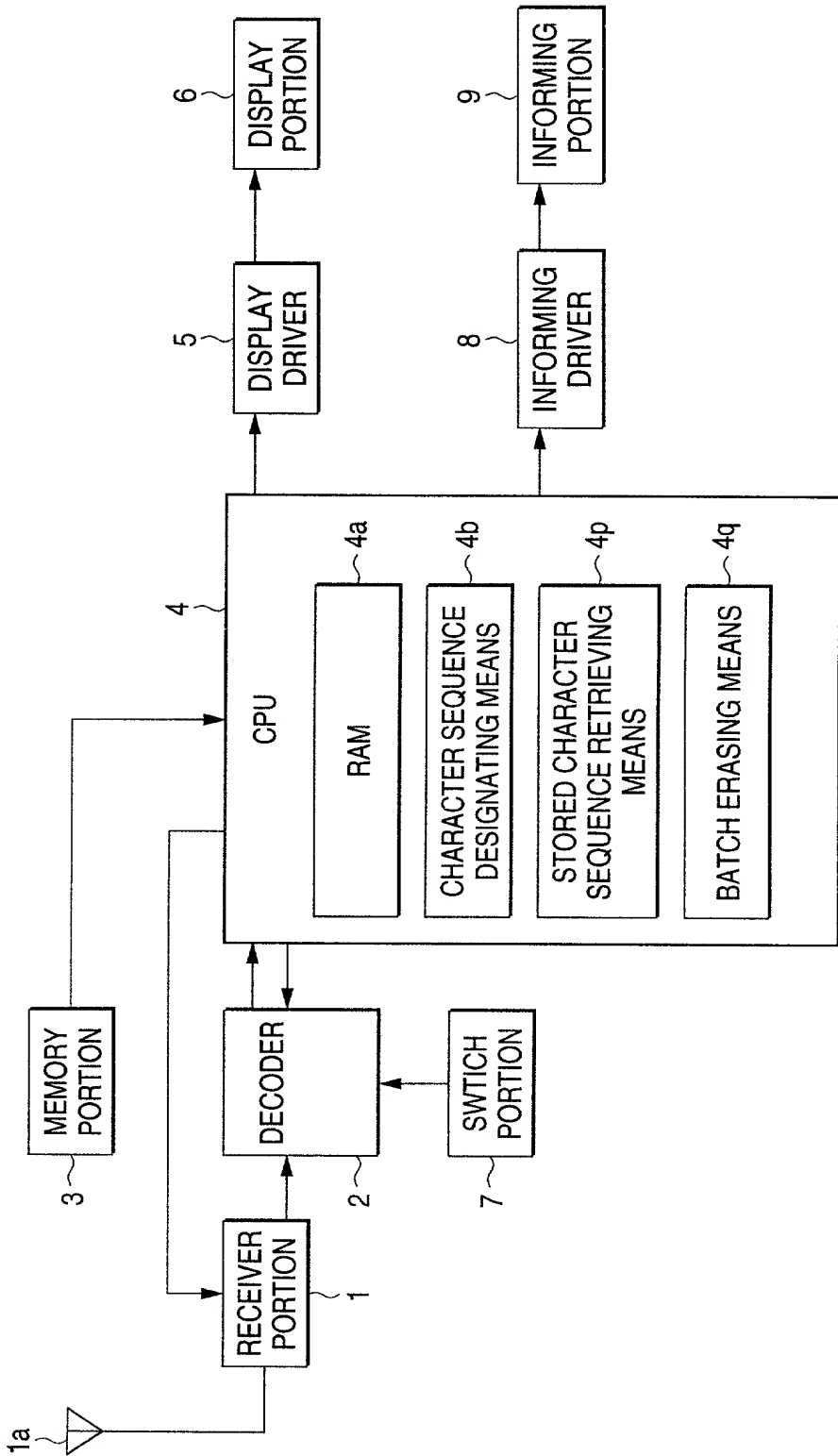


FIG. 14

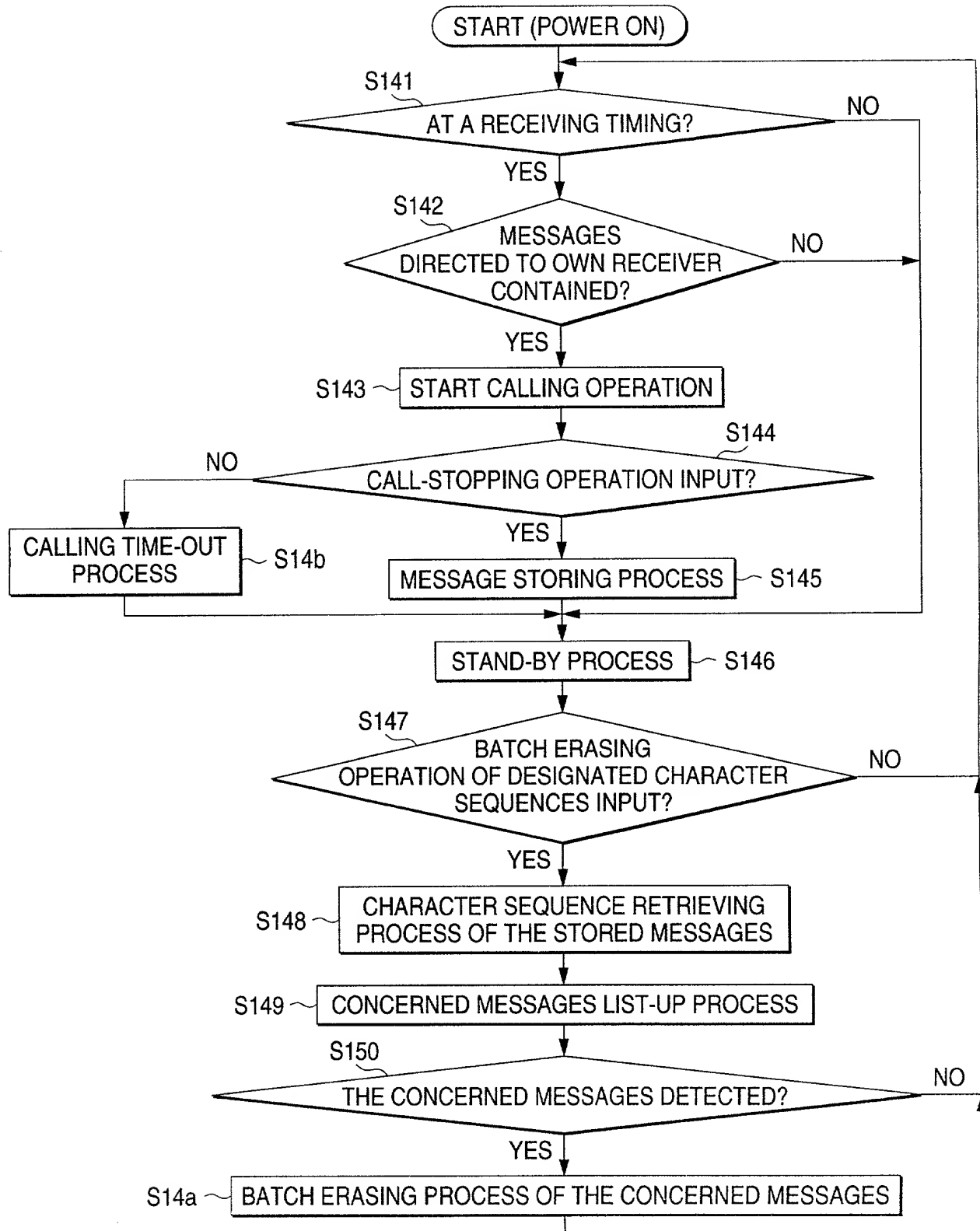


FIG. 15

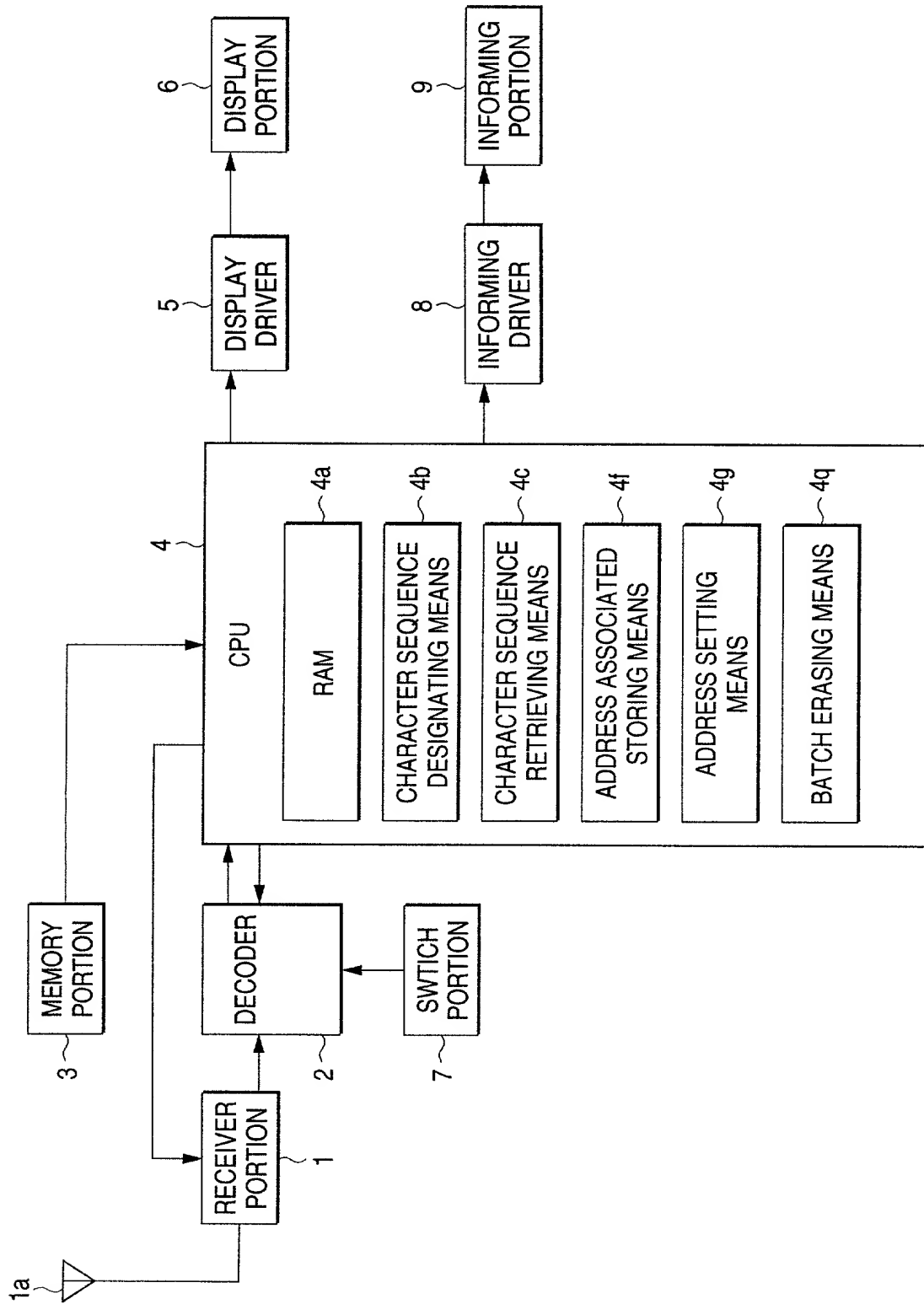


FIG. 16

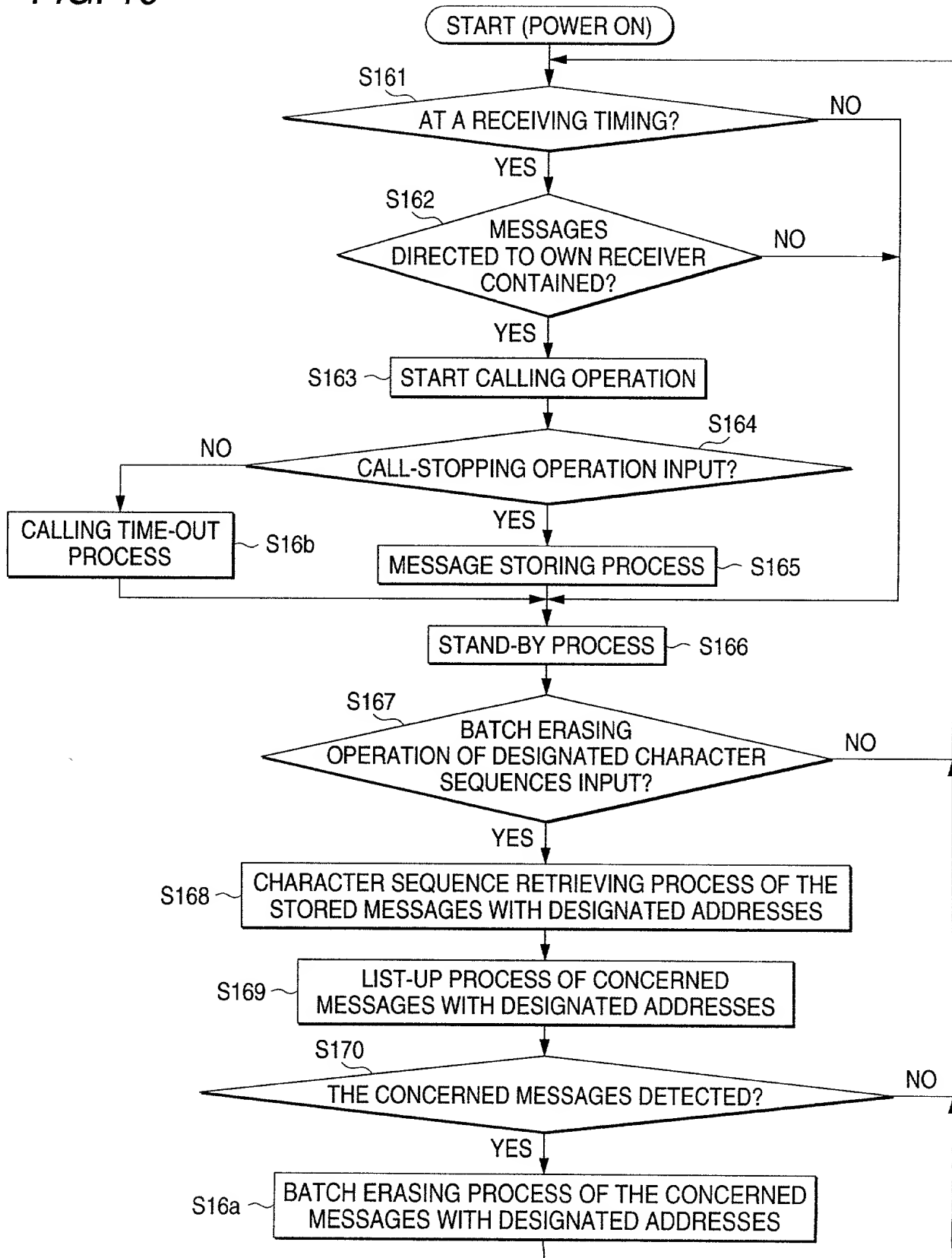
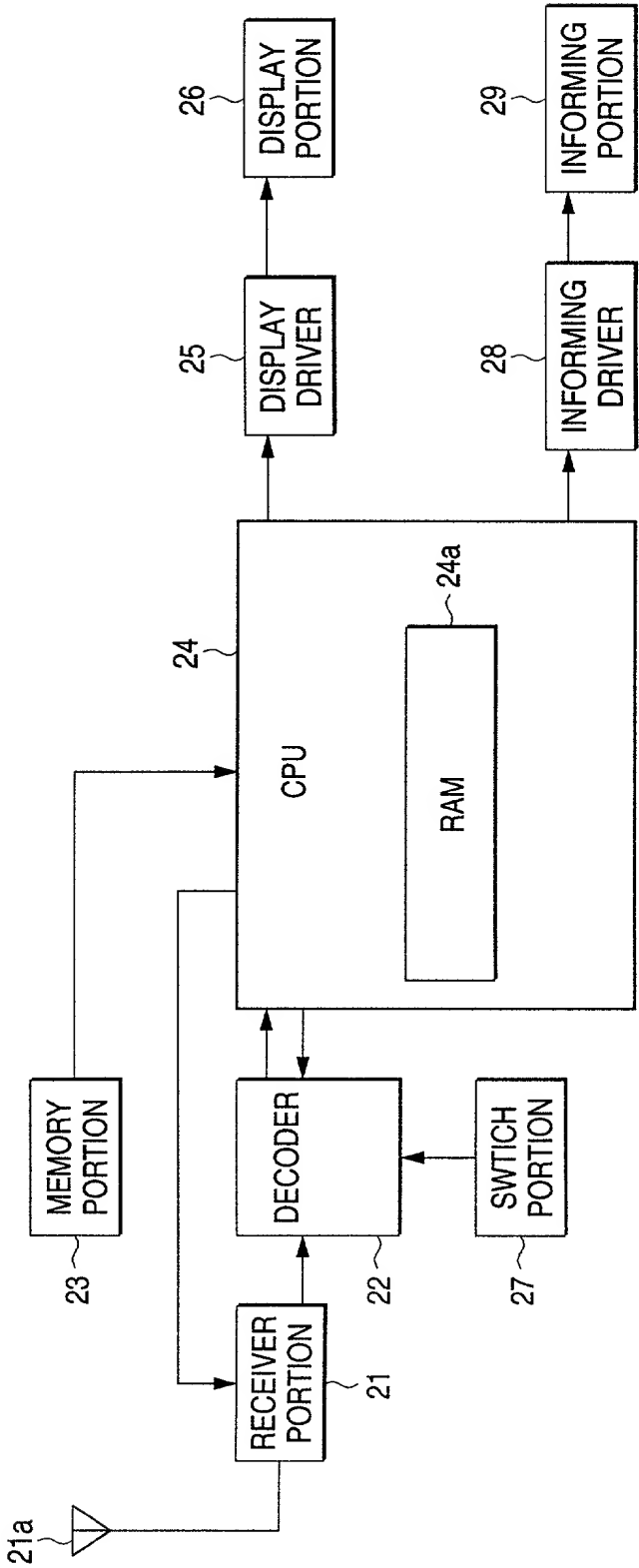


FIG. 17
PRIOR ART



**COMBINED DECLARATION AND POWER OF ATTORNEY
IN ORIGINAL APPLICATION**
(Sole or Joint - Foreign)

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name.

I believe that I am the original, first and sole inventor (if only one name is listed below) or an original, first, and joint inventor (if plural inventors are named below) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

RADIO PAGING RECEIVER AND MESSAGE ERASING METHOD,

the specification of which

XX is attached hereto.

_____ was filed on _____ as application Serial No. _____ and was amended on _____.

I hereby state that I have reviewed and understand the content of the above-identified specification, including the claims (Pearne, Gordon, McCoy & Granger Docket No. _____), as amended by any amendment referred to above. I acknowledge my duty to disclose information of which I am aware which is material to the examination of this application in accordance with Title 37, Code of Federal Regulations, Section 1.56.

I hereby claim foreign priority benefits under Title 35, United States Code, Section 119, of any foreign application(s) for patent or inventor's certificate listed below, and have also identified below any foreign applications for patent or inventor's certificate having a filing date before that of the application on which priority is claimed.

Country	Application Number	Filing Date (day/month/year)	Priority Claimed?	
			Yes	No
Japan	P. Hei. 10-192338	24/June/1998	XX	

I hereby designate the following as my mailing address and telephone number:

Pearne, Gordon, McCoy & Granger
1200 Leader Building
Cleveland, Ohio 44114
(216) 579-1700

and appoint each of the following as my attorneys with full power of substitution and revocation, to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith:

Charles B. Gordon, Reg. No. 16923
William C. McCoy, Reg. No. 16885
Richard H. Dickinson, Jr., Reg. No. 18622
Thomas P. Schiller, Reg. No. 20677
David B. Deioma, Reg. No. 22841
Joseph J. Corso, Reg. No. 25845
Howard G. Shimola, Reg. No. 26232
Jeffrey J. Sopko, Reg. No. 27676

John P. Murtaugh, Reg. No. 34226
James M. Moore, Reg. No. 32923
David E. Spaw, Reg. No. 34732
Michael W. Garvey, Reg. No. 35878
Mark E. Bandy, Reg. No. 35788
Paul R. Katterle, Reg. No. 36563
Richard M. Mescher, Reg. No. 38242

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

(1) Inventor (sole or joint): Yasushi ABE

Citizenship: Japan

Signature Yasushi Abe

Date May 31, 1999

Residence: Kanagawa, Japan

Post Office Address: 2446-5, Miho-cho, Midori-ku, Yokohama-shi,
Kanagawa 226-0015 Japan